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PSYCHOLOGICAL STUDY OF THE DEAF CHILD.*

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Psychology as applied to the study of the deaf child in its development from infancy to an independent status of maturity, is a complicated and many-sided problem which has taxed the capacity of parent, educator and scientist.

Child study has reached the unwholesome stage of "faddism." This fad has been actively stimulated by mothers of leisure, popular scientific writers in the magazines, ambitious and theoretical social service advocates and radical scientists. The fad is healthy as long as it remains active and within limitations; the enthusiastic advocates of such a fad contribute substantially to the good of the cause as long as their theories do not multiply in inverse ratio to their practices. Theory is the forerunner of practice, but in every science it must maintain a rational balance.

The psychological study of the normal child has made definite, effective progress, and the system of education now advocated is a remarkable evolution of the past few decades.

Were a trained pedagogue of a quarter of a century ago to walk into a modern schoolroom to-day, he would find a course of study, a plan of practical pedagogics, a disposition of the individual pupil, a scholastic atmosphere and a kind but positive influence,—working forces so radically different from that to which he had been trained

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that he might scarcely recognize the fact that these periods were in any way correlated.

To what should we ascribe this marked evolution? Has the child-brain become suddenly susceptible to a higher potentiality? Has the parent assumed a greater responsibility? Has the teacher developed a more forceful influence? Or, is there a fundamental principle to which we may logically ascribe our present methods of training?

There has been no radical change in the quality or capacity of the child-brain other than that of increased perception. This increased perception has been made possible by a change in direction through which knowledge is imparted. There has been no greater responsibility assumed by the parent other than increased participation in the active work of the child. If a more forceful influence has been created in the teacher it may be credited to his improved method of demonstration, his maintenance of merit and honor systems, the abolition of corporal punishment, the increased sunshine in the schoolroom, the introduction of better hygiene and the contributions of medical science to the improved status of the individual pupil. This scientific contribution consists essentially of the examination of the eyes, ears, nose and throat of the pupils, and the proper direction and disposition of all defects here found. These defects we now recognize as the major cause of inattention, sluggishness, lack of application, and many other equally vital factors in the upbuilding of a child's character.

The foundation on which rests this modern educational reform may be summed up in one expression, "Applied Psychology."

What applies to the psychological study of the normal child must be concentrated in an intensified form in our responsibilities to the defective child. To those of us engaged in a careful study of the conditions and needs of the deaf child, the many handicaps daily met with often appear almost insurmountable.

The great English physicist, Tyndall, states that *all of the organs of special sense are but modifications of the sense of touch.* The sense of sight depends on the contact of a wave of light with the retina before a mental impression is formed; the sense of hearing becomes tangible only when a wave of sound has reached and stimulated the organ of Corti; the sense of smell receives its impression from the contact of smellable substance with the end-filaments of the olfactory nerve distributed in the nasal mucosa; the sense of taste is but a touch sense located in the sensitive areas of the tongue and palate.

If, then, Tyndall's theory is conclusive and accepted, we may readily comprehend why so much stress is placed on the development of the tactile sense in the education of the defective child. The higher development of tactile impression is not a recent innovation in the training of the deaf. Even Montessori, in emphasizing the importance of tactile sense-training in her system of special education, has adopted this important educational adjunct from the system employed in teaching the deaf and the blind.

The organs of special sense are the means through which every perception of the human mind is made possible. If a child has unfortunately been deprived of the sense of hearing, it creates a defective force to be reckoned with in every phase of the upbuilding of the child's character. Every physical stimulus, every mental impression, every moral influence must be given consideration from an unusual angle in its transmission to and interpretation by this child. The very nature of a deaf child is cast in a different mould from that of the normal child; the absence of the sense of hearing confronts us with a serious problem in every phase of development in the intellectual life and spiritual education of this child.

Classification.

In attempting to classify psychological principles in their application to the education of the deaf child, I offer the following somewhat arbitrary but comprehensive subdivisions:

1. Observation.
2. Concentration.
3. Imitation.
4. Memory.
5. Correlation.
6. Imagination.
7. Rhythm and mechanics.

The subdivisions of this classification all admit of practical illustration and application, and I have purposely avoided the theoretical and abstract phases of psychology. Of course, it will be difficult to confine our discussion within the prescribed limits of such subdivision, as it will be found that one phase of our applied science merges into the other, or is closely bound up with several other phases.

1. *Observation.* Whether the faculty of observation in the deaf child is developed largely through the sense of touch or through

the sense of sight the fact remains that tactile impressions are our most reliable and tangible forces in stimulating the child's mind.

Let us assume that the child before us is totally deaf, is five years of age, and has had no special or technical training. At this stage of his development he has acquired many of the habits, manners and acts of normal children, but his power of observation has been seriously handicapped by the limited avenues through which his mental functions are stimulated.

For the training of sight we use gestures, gymnastics and, later, special movements of the tongue, lips and palate. Recognition of form is accomplished by a combination of the sense of sight and touch.

The use of blocks and geometrical solids to stimulate the touch and sight faculties is an effective method of sense training and may be considered in various stages:

(a) The child is shown a geometrical solid and is then asked to select same by sight from a number of different-shaped solids.

(b) The child is directed to feel a solid object while closing the eyes and is then asked to recognize the same object by sight. This correlates his sense of sight and sense of touch.

(c) The child is shown a solid object and then selects same by sense of touch with eyes closed. This is the reverse of the second step.

(d) From a series of blocks of different shapes, the child is asked to select one block by sense of touch. This block is then returned to the rest of the collection and the child directed to select same by sense of touch alone. This sharpens the tactile sense for comparative sizes of lines and surfaces.

(e) Two blocks of slight variation in size and shape are presented to the child; he selects one by sense of touch and is then required to find that particular block from a larger group of objects.

In similar manner, the pupil learns to differentiate textures and irregularities of surfaces and the touch-sense is so acutely sensitized by constant practice that he is eventually enabled to distinguish the difference in vibrations of musical tones, the differential vibrations of the voice in the throat and chest, which is a vitally important factor in his technical training. Not only does this practice develop his power of observation, but it also stimulates his faculties of concentration, memory and correlation.

2. *Concentration.* One of the real difficulties encountered in the early training of the deaf child is his lack of concentration. In

reading, independent study, and other mental activities, the advanced deaf pupil has the advantage of being able to concentrate his mind on his work without the added extraneous diversions of noise and all forms of sound to which the normal hearing child is subjected. On the other hand, the deaf child not only sees but also *hears* through the sense of sight and is constantly on the alert for all visible changes in the schoolroom and in his surroundings even when attempting to concentrate his attention on the individual work prescribed for him.

When a photographer desires to pose a prattling, restless, lively baby before a camera, he arrests his attention by holding some bright or unusual object before the child at a fixed point. This momentarily arrests the child's attention and gives the photographer his opportunity for a picture. A crying baby is cajoled by a rattle or other sound, a moving, bright object, clapping of the hands, sudden change of position, patting on the body, or any of the other numerous resources employed to arrest the child's attention. *Attention* is the basis of concentration; concentration is an indispensable aid to teacher and child.

Our deaf child, therefore, must have his attention engaged in some familiar way by which faculties already alert, may be stimulated.

In the class-room a favorite method of developing the power of attention in the young deaf child is the use of *matching exercises*. Matching colors and objects not only trains the eye, but develops memory and concentration. Even though the child may not know the names of the colors he is asked to compare, he instinctively cultivates a comparative color-sense by such practice. By the use of matching charts the teacher studies the dawning of the child's attention faculty and the child becomes more interested in the work of the teacher and in the acquisition, day by day, of new ideas. He cultivates concentration and the pleasure of learning. The more attractive we can make the form and character of the child's daily instruction, the more readily will we get his co-operation.

3. *Imitation.* One of the fundamental principles in the education of the child is imitation. Imitation is the foundation on which we build gesture, expression, speech and all voluntary movement. It, therefore, is utilized as one of the most valuable aids in child-training.

Imitation develops almost simultaneously with observation. The first use of the organs of speech, as the tongue and lips, and the use of the breath, are taught through observation and imitation.

The child that has never spoken a word is shown a feather or a slip of paper. The teacher holds the feather or paper close to the mouth and blows lightly and sharply upon it. The child sees the act and feels the impulse of breath and is directed to imitate it. The result is the letter "p," "t," "f" or some breath consonant, depending on the position of the lips and tongue. The differentiation of these breath consonants soon becomes apparent and the way is prepared for more complicated sounds.

The positions and movements of the tongue are both observed and imitated. Quick hand-movements and gestures give the child additional opportunities for imitation. From the combination of movements of the tongue and lips, speech is gradually evolved. Correct breathing is acquired with somewhat more difficulty. Incidentally it might be added that insufficient attention has been given to breathing and breath control in the training of the deaf child and in the correction of defects in speech.

Imitation is further accentuated by directing the child to reproduce objects that it sees and movements that are made. Three marbles are held up from a box of marbles; the child is directed to produce the same number of marbles, and this, his faculty of imitation soon enables him to do. Two kindergarten sticks are placed at right-angles to each other; the child is asked to reproduce this position and when this has been effected, he is asked to draw lines on the board in the same position. If he does so correctly from the objects before him, observation and imitation have been called into question. If he draws the object on the blackboard without seeing it, another faculty is being stimulated.

4. *Memory.* Memory combines the three previous faculties, observation, concentration and imitation. Memory is required to produce speech, to perform an act, to spell a word, to call a name, and to reproduce any process of mental activity.

The normal child first acquires speech by meaningless repetition of some elementary sounds. Before the babe can say "mama" it prattles "mamamama" or "papapapa" without significance. This principle has been recognized as the basis for teaching speech to the deaf. Miss Josephine Avondino, of the Central Institute for the Deaf, whose work along this line has been especially intensive, in describing her "system of babbling," says, "The movements of the muscles of the body of a very young infant are but evidences of the instinctive impulse to act, and, specifically, the movements of the lips and tongue and the cooing of a baby are the instinctive prepara-

tion for speech. This elementary stage of vocalization soon passes and he reaches the babbling stage. This stage extends over a long period until definite sounds and syllables are gradually acquired."

The cultivation of memory for the acquisition of speech in the deaf child is of even greater importance than memory training for the normal child.

5. *Correlation.* The essential principles of observation, concentration and imitation are the a, b, c to the acquisition of speech. To this we add memory for the reproduction of speech, but there is still a vital factor necessary to the unfolding and higher development of the child's mentality—the comprehension of speech. A child may be taught the word *mother*. It may then be told that the word *mother* applies to a definite person. These two mental impressions may exist independently in the child's mind. The climax of these impressions, however, does not become apparent to the child until he realizes the relationship between the word *mother* and the person to whom this word applies. This association of ideas, or, as we have classified it, correlation, constitutes one of the most subtle refinements in the psychological study of the deaf child.

When correlation becomes active in the scholastic work of the deaf child, his mind receives a tremendous stimulus, and from that time we note a decided advancement, not only in his scholarship, but also in his speech work, facility of expression, and working ambition. A practical example of this unfolding of the child-mind is presented in the following case:

E. M., a girl of seven, was admitted to the Central Institute for the Deaf, September, 1914; she was born deaf; functional tests corroborated this statement. There were not even tone-islands of hearing; at a distance of six inches the child was able to repeat the vowels *Ah! Oh!* when called into the ear in a loud voice; the differentiation was uncertain.

This little girl is now in her second scholastic year of oral training; she reads, writes and speaks with fair fluency as compared to a normal child in the same period of training. Her speech is fluent, her voice flexible and well-modulated. As soon as this child was able to comprehend, read, and speak phrases and sentences, it occurred to me to apply the principles of re-education as advanced by Urbantschitsch, Bezold, Gradenigo and others. I was astonished to find after a few trials that this child could perceive spoken words and phrases when called into the ear with a moderate volume of voice. To-day she is getting her training not only by speech-reading and articulation, but by actual auricular exercises. She

can even repeat sentences containing words of which she does not know the meaning and her oral training progresses much more rapidly with the assistance of her increasing hearing capacity.

We have been taught that in the congenitally deaf child the organ of Corti shows but an atrophied remnant of filaments of the cochlear nerve. What, then, has been the reconstructive or regenerative status that has taken place in this child's auditory perceptive mechanism? Re-education of the deaf implies, as its name would indicate, the re-stimulation of a sensory apparatus that at some time was active. In this case, however, there had never been an active auditory sense and the actual hearing capacity of to-day must be regarded as a new and constructive feature and not as a re-education or re-construction. What the psychological element stimulated in this case might be, I am as yet not prepared to say.

I would say that the marked stimulation in this child's mentality and speech began at the time when the association of ideas or correlation of words and thoughts was first developed.

6. *Imagination.* Independence and facility of expression are best developed by cultivating the power of imagination. Last week the editor of one of our influential daily newspapers visited the Central Institute and related an interesting story to a number of our pupils of eleven or twelve years of age. The story contained, perhaps, a thousand words. The *raconteur* is a man with a full beard and his speech is rather nervous and rapid. Six of our children listened to the story and acquired the subject matter entirely by lip-reading. They were given a pad and pencil and asked to write the story as they had received it. The written story in each of the six children was expressed with individuality, conciseness and accuracy. The essentials were maintained but in each instance the form and character of the story was reconstructed in accordance with the mentality and imaginative ability of the pupil. It was interesting to note how much variation could be given by these child-minds in this instance. Imagination, as a psychological element in child-training, offers splendid opportunities for independence of expression and it is in this form of practice that such facility of expression is developed. M. W., an eight-year-old girl, lost her hearing completely at three years of age following an attack of cerebro-spinal meningitis. She has been a pupil of the Central Institute for two years. Last week she was given a picture chart and asked to write the story which the picture suggested to her mind.

The imaginative sense expressed by this child is the more remarkable when we consider that her home surroundings are somber and her nature serious. With the stimulation of her imaginative faculty, additional sunshine is injected into her scholastic work and a new impetus given to the child's ambition. Cultivating the imaginative sense materially assists the child in language construction, and develops actual, rather than abstract, expression. Imagination stimulates originality and actively assists in enriching the child's vocabulary. Here is her story:

THE LITTLE LOST CHILD.

One day last spring, a little girl was lost. Her name was Annie. She wore socks and slippers. She had a little dog. His name was Fido. She stood on the street under a big umbrella. She was looking for her mother. She cried because she could not find her home. In the night she was very tired and sleepy so she sat on the grass and went to sleep. In the morning she got up and said, "Oh, I am so hungry. Where shall I go?" After a while a woman saw her crying. She asked her what was the matter. Annie said, "I am lost and don't know how to go home." Then the woman took her to a store and bought her some ice cream and candy. After a while she was taking a walk with her down the street when her mother saw Annie. She took her home. Annie was glad to see her mother and father and she resolved not to take a walk by herself again.

7. *Rythm.* An unconscious accessory in child-training is the mechanical or automatic correlation of movement in the perception or vocal expression of thought or action. A number of our pupils have been taught to vocalize the musical scale comprising a whole octave. These pupils hear no sound. The notes that they produce with a fair degree of accuracy are evoked by purely mechanical means. They are taught tone placing, the position of the larynx, direction and projection of the voice, the control of breath and the intensity of voice vibration. Their tones are even sustained and mechanically correct. Their control is measured entirely by the tactile sense, especially the sensation of vibration and the differentiation of resonance. Tyndall has made the pertinent observation that light, sound, heat and electricity are all phenomena

produced by waves of motion, varying only in degree, quality and intensity.

An ingenious adjunct in the training of the deaf has been introduced by a progressive Eastern teacher. By the use of the piano the deaf child is trained to interpret differences in pitch of a vibrating note or chord. We have used this training constantly with our pupils. The pupil stands with his eyes closed and his fingers resting lightly on some part of the wooden piano case, or in some instances the pupils stand with their back to the key-board some distance from the instrument, depending on the transmission of vibrations through the floor. They can differentiate the bass chord from the middle register; a middle register from the upper *clef*, and these notes or chords can be struck in every variation and interpreted by the pupils with accuracy.

The physical principle involved in this experiment is obvious, the lower the pitch of the note the fewer the number of vibrations per second; the higher the pitch of the note, the more frequent the vibrations per second. It is not the hearing faculty of the pupil, however, which makes this tone differentiation possible, but the actual sharpened tactile sense by which the difference in rapidity of vibration of a sustained tone is perceived.

The value of this mechanical production of the musical scale or the interpretation of the musical vibration to differentiate the pitch or a note has an important and significant application in our work with the deaf. There is a characteristic and almost invariably present monotone in the speech produced by the deaf and it is to overcome this noticeable defect in speech production that we lay unusual stress on the mechanics of voice production. By increased flexibility of voice, greater accuracy in pitch, better volume and more and more natural placement, we hope to reach such a high degree of efficiency that this characteristic monotone may be eliminated.

3858 Westminster Place.

AUDITORY RE-EDUCATION.*

DR. THOMAS J. HARRIS, New York City.

The achievements of otology for the last twenty-five years, form one of the most brilliant chapters in the entire history of medicine. The modern mastoid operation and what it has accomplished in the saving of innumerable lives, has served to put the specialty of otology in the forefront of modern surgery. All honor to Schwartze and his followers in Europe, and to Gruennig and a host of others in this country, who were instrumental in bringing it about!

At first blush it would seem that no greater triumph could be won than the conquering of aural suppuration and its dread sequellae. We venture to assert, however, that in the last analysis, life itself may not be so valuable to an individual as the ability to secure an honest livelihood. No greater handicap in this respect exists than that caused by excessive and incurable deafness. With sorrow it is to be admitted that our success in combatting this is in no way in proportion to what we have succeeded in accomplishing in the cure of suppurative processes in the ear.

The all-important contributions to the treatment of tubo-tympanic deafness, of slight or even moderate degree, made by Politzer nearly a half century ago, will stand as a lasting monument to his name. With the exception of the valuable addition made by Holmes, in the direct treatment of the Eustachian tube, little has been effected in this direction since Politzer's original communication. All of our modern methods for the treatment of deafness have to do chiefly with those who are only partially deaf. There remains the great body of victims afflicted with deafness in an advanced and excessive degree for whom up to the present time we have had nothing of encouragement to offer.

For them auditory re-education by means of sonorous vibrations has been advanced by its advocates as offering the one encouraging means of relief. On the other side of the Atlantic the subject has received careful attention from numerous investigators. In America, with the exception of two papers from a single observer, our literature appears to be entirely lacking. And yet, it is by no means a new method of treatment. Urbantschitsch many years ago brought it before the profession and since then has consistently advocated it. Before him it is stated that as far back as the first century sounds

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of various intensity for improving the hearing were used by Greek physicians.

During the last ten years it has been the subject of important papers by a number of French scientists, of whom Marage, Zünd Burguet, a teacher in a school for the deaf in Paris, Raoult, and most recently Maurice, are especially to be mentioned. So far as the physiology of the treatment is concerned, it rests upon a sound basis. Hubby, in a paper written two years ago, clearly shows all the cells of the body must functionate or degenerate, and that in subnormal hearing there is a reduced action in all the physiological processes of the entire auditory apparatus, asserting, and we believe correctly, that if the hearing is reduced one-thirtieth of the normal, the auditory nervous system receives one-third of the impulses received in health. The effect of this can be easily appreciated inasmuch as it concerns not merely the parts actually used but also the neighboring structures, such as the tympanum, the Eustachian tube, labyrinth, etc.

Abundant evidence exists for the value of auditory re-education in the results constanly being obtained in the training of the other special senses. It is well known how the eye can be trained for the microscope, and how the sense of taste is developed in teatasters, etc.; also, how the blind acquire peculiar skill in the sense of touch and hearing. The importance of the role that the sympathetic system plays in all this cannot be easily estimated. There is in effect a pneumo-massage which, when not carried to the point of fatigue, increases the nutrition and efficiency of all the structures stimulated.

Theoretically, the human voice is the ideal instrument for producing such an effect. It is not sirens, nor tuning-forks, nor watches which the deaf person desires to be able to hear, but conversation. This Urbantschitsch recognized in his original communications upon the subject. An instant's reflection, however, will show that while theoretically ideal, in practice the voice is difficult or impossible of being used. For proper re-education the entire range of the ear for speech must be covered. This, in effect, demands not one, but four or five voices, namely, soprano, contralto, tenor, bass, and baritone. Apart from the impossibility of meeting this condition, the fatigue upon the voice used for the purpose of training, as well as the slow results secured, makes it impractical for actual employment.

The necessity of a proper mechanical substitute, accordingly, has been recognized by Urbantschitsch and all other workers in the field of auditory re-education. Any such substitute, as pointed out by

Zünd Burguet, should comply with two conditions. First, "it should be capable of reproducing tones covering in range at least five octaves, not only producing them by tones and semi-tones, but covering all the vibrations from 100 per second, which represents the lowest limit that the human ear is wont to recognize, to 3,500, the highest limit." Second, "the emission of sound should be of absolute regularity and of a constant intensity in all the registers, and capable nevertheless of being instantly varied to conform to the need of the individual ear to be re-educated."

Marage has devised a series of sirens. Of the exact construction of these and how far they comply with the conditions laid down, we are not able to speak. Six years ago Zünd Burguet devised an instrument which he has named the "electrophone," which, in his opinion, complies accurately with the requirements just enumerated. We quote the following regarding it from a recent paper by Hubby, who, in this country, has given it careful study and trial: "It covers the range of the human voice, consists of about the same harmonics. By means of the three registers the timbres of three voices, low, medium and high, are produced. The employment of the vibration can be instantly varied to stimulate each ear according to its separate requirements. The intensity of the sound can be ranged sufficiently so that the length of the treatment is not fatiguing to the patient or the operator. The tones can be maintained at a given intensity as long as necessary. In its essential details, the instrument consists of three faradic hammers whose lengths can be altered by means of levers, with telephonic ear receivers."

More recently Maurice, a specialist in Paris, has devised an instrument, also electrically operated, which he has named the "kinesiphone," and which he also claims in all particulars meets the conditions that have just been laid down. With none of these instruments have we had any personal experience. Accurate clinical reports exist in the literature, however, upon the use of the electrophone. A paper by Raoult gives a report of thirty-six cases which have been treated by means of the instrument, seventeen by himself, fourteen by Zünd Burguet, and five by Helmoortel of Antwerp. These cases are set forth in detail and the reports comply with all the conditions which are necessary to render them valuable, such as careful testing before beginning of treatment, description of functional tests, number of treatments given, length of time, tests made at regular intervals during treatment, and at a prescribed time after treatment has been discontinued. Reference has been made already to the accurate work in this country with the instrument by a fellow-member of

this Society, Dr. Hubby. Raoult reports 100 per cent of improvements in his thirty-six cases, dividing them clinically as follows: Otosclerosis, fifteen; O.M.C.C., twelve; O.M.P.C., two; otitis interna, one; aural neurosis, one; deaf mutism, one; otitis chronica adhesiva, four. Hubby reports with equal care as to the details just enumerated, thirty-two cases. His results are far from being as favorable as those of Raoult, and his summary is too lengthy to be recorded here. The conclusion arrived at in his paper, however, is that "the results are sufficient to show the usefulness of the treatment in many cases of acute and chronic conditions of the ear."

Maurice has not published in detail, as have Raoult and Hubby, the results which he has obtained with the kinesiphone. This he was on the point of doing when the war broke out. While he insists that the instrument is in no sense a "cure-all," he makes the claim at the end of a paper on the subject, written three years ago, "that experience in a long series of cases justifies the assertion that it is possible to secure improvement in the hearing by means of re-education in all cases where there is even a little hearing present."

Professor Lavrand, of Lisle, writing at the same time, reports in detail five cases treated with re-education by means of the kinesiphone, in all of which he succeeded in securing improvement in the hearing. He gives no diagnosis of the cases, but from the reading of their history and tests, they would appear to be all cases of O.M.C.C.

Our own investigations on the subject of auditory re-education have been carried on entirely with an instrument known as the Meyer-Rowan instrument. We approached the subject originally with considerable misgiving. We were woefully ignorant of it and entertained the impression which has obtained to a greater or less extent in this country due, probably, to a certain unfortunate commercialism of which it was accused, that it was only another attempt to beguile both specialist and patient and that its use or investigation was unworthy of any one who was jealous of his reputation.

A brief study served to show us that whatever might be said of individual instruments, the subject was founded on a strictly scientific basis and was deserving of the most careful and prolonged consideration. Professor J. Loring Arnold, of the University of New York, has examined the instrument from the acoustic standpoint, and it is in order to read his description at this point.

"After an investigation of the Meyer-Rowan instrument which was sent to the University for my inspection, I can make the following statements:

There are four cylinders. The range of tone between the two extremes appears to be a range of from about fifty vibrations per second to one hundred vibrations per second. The pitches of the intermediate cylinders falls between these. The pitch of each cylinder may be regulated through about a whole tone.

With an increase of intensity by the aid of the rheostat, there is a marked change in pitch, about half a tone, also a change in quality.

The general quality of the tone emitted is not simple, but comparatively rich in overtones. Combinations of the cylinders increase this complex quality of the tone."

In addition there is a motor and pump, for the application of light alternate suction and pressure through the external auditory canal and through the Eustachian tubes, for breaking the intensity of sound waves, and for use with connections open to drums, in treatment consisting of very light sound waves, without use of hammer. Treatment is given at first very gently, and for a short time. The effect upon the drum membrane is to be carefully observed. The strength of the current to be used depends upon the extent and duration of the deafness. In advanced cases it will be necessary to use a strong current. In beginning cases, gentle vibrations are all that will be required. According to the particular condition present, treatment through the auditory canals alone is employed. In other cases, especially where the Eustachian tube is obstructed, treatment by means of the catheter has been found to be of advantage. In still other cases, the combined treatment through the Eustachian tube and auditory canal simultaneously has proved beneficial. The treatments vary in length from three to seven minutes, and are repeated not oftener than every fifth to third day. There is apt to be a temporary confusion following the treatment, as well as flagging in the hearing, which, however, soon subsides.

The observation of Hubby, that sonorous vibration benefits the condition of the Eustachian tube, has been repeatedly confirmed in our own cases.

Our studies extend over a period of sixteen months. They represent in all twenty-five cases. To these we are able to add the reports of nine cases courteously supplied us by Dr. Charles O'Reilly, of Philadelphia, and the reports of twenty cases treated by Dr. Robert Clyde Lynch, of New Orleans. Five of the nine cases treated by Dr. O'Reilly were cases of O.M.C.C., and four were otosclerosis. In five of the nine cases, marked improvement resulted as far as the tinnitus was concerned. The results in regard to the

hearing were not as good. Of the nine cases, the hearing was improved to a greater or less degree in four. It is fair to say, however, that several of the cases had only a few treatments, or are still under treatment.

All of Dr. Lynch's cases are cases of otosclerosis. In a letter to me recently, he states that in only two of them can he tabulate any progress in the deafness. "In all cases of otosclerosis," he states, "I can do more with it, give my patients more comfort, and in some instances surprise myself with the results obtained."

The twenty-five cases treated by myself are set forth in detail in the accompanying table, and are divided as follows: Otosclerosis, eight; O.M.C.C., twelve; O.M.P.C., residuosa, two; tinnitus (O.M.C.C.), one; O.M.P.C., one; and Eustachian tube catarrh, one. In the eight cases of otosclerosis, improvement was obtained in six, or 75 per cent. In the twelve cases of O.M.C.C., improvement was secured in eleven (in one only slightly), or 92 per cent. Improvement was obtained in the case of tinnitus, but no improvement was secured in either of the cases of O.M.P.C. residuosa. Case twenty-four was one of quiescent O.M.P.C. which presented itself for treatment of excessive deafness. The improvement in the hearing was nothing less than remarkable. Case twenty-five, one of inflammation of the Eustachian tube, showed decided improvement. In a summary of the twenty-five cases, improvement was obtained in twenty, or 80 per cent.

It is to be added that our tests in all these cases have been made as accurate as possible, and we have been inclined to underestimate rather than to overestimate the amount of improvement recorded in a particular case. Particularly do we desire to go on record as saying that the diagnosis in every one of the cases of otosclerosis was made after a thorough test. This is said in view of the commonly held opinion that because of the pathology of this affection, improvement in the hearing cannot be expected. All of the six cases of otosclerosis which improved under treatment were greatly improved. Of the eleven cases of O.M.C.C. which were improved, ten were greatly improved and one only slightly.

Conclusions. It is in order, now, to state briefly some of the deductions which may be properly drawn from this investigation of ourselves and others, and, first of all, what answer is there to the one question which naturally arises in everyone's mind, namely, is there any merit in the treatment?

After careful study we are prepared without reserve to say that the clinical results bear out the physiological *raison d'etre* for

auditory re-education. The more that we use it, the more pleased we are from time to time with the results that are obtained. It is undoubtedly true that much remains to be done to put it upon an exact basis. For instance, no rules have yet been formulated to show in what class of cases we may expect with confidence it will succeed, and in what fail. It is self-evident, as has been previously stated, that a patient with complete loss of hearing is an unsuitable one for this or any other form of treatment.

It has been abundantly demonstrated, however, by the reports of Raoult and Maurice, that impairment of hearing to a pronounced degree is capable of being greatly improved by the method. Our own cases were largely those of otosclerosis and O.M.C.C. Here, as has just been shown, the improvement was in a considerable percentage of cases decidedly gratifying. Other observers have reported equally good results in the treatment of aural suppuration and tinnitus. Tinnitus would seem to be a favorable symptom for relief, although personally we have had but few cases where we have relieved it. With its use in suppuration our experience is limited and we cannot speak with authority.

Of prime importance is the working out of rules or a system by which the exact dosage of the sound-waves can be given to the particular case. Hubby's criticism that suction or pneumassage are capable of doing harm to the previously relaxed drum must be admitted, especially if care and judgment are not exercised.

Two important points should be borne in mind by anyone undertaking to make use of the treatment. First, that it is not fair to this mode of treatment any more than to any other, to condemn it if success is not obtained at the first or even at the second sitting. Only after a course of treatment, given at intervals of three to five days, and covering, according to the case, a number of weeks, are we warranted in deciding it is of no benefit. Further, it is always to be remembered that the cases where it is apt to be used are cases where all other treatment has failed, and which in every sense are pronouncedly chronic. The second point is that after benefit has been secured, and the treatment stopped, maintenance of the improvement cannot be expected unless home treatment is continued or a resumption of the treatment for a short time at proper intervals is carried out.

Raoult has rightly made the point, too, that often the falling off in the hearing after the cessation of treatment, is apparent and not real. The patient says he is not hearing as well, but this can be due to the fact that as he began to hear better, his friends no longer spoke in so loud a voice.

A further important fact to be borne in mind when giving the treatment, is that a lowered condition of the general health can seriously interfere with improvement. This is also true when there is an attack of stomach trouble, or when the patient is suffering from a severe cold.

To recapitulate, we are prepared to make the following conclusions:

First, that auditory re-education is not a plaything.

Second, that it rests on sound scientific principles.

Third, that its correct and accurate application, so far as one particular instrument is concerned, has not yet been fully determined.

Fourth, that a thorough understanding of whatever instrument used is essential in order to insure greatest likelihood of success.

Fifth, that accurate tests should be made before beginning treatment and at intervals during treatment.

Sixth, that there should be a sufficient number of treatments at proper intervals.

Seventh, that great care and judgment are essential in the use of any of the mechanical appliances, as by improper or excessive use decided harm can be done.

Eighth, that auditory re-education in no way supplants any other treatment to nose, throat or ear, which may be indicated.

CASE REPORTS.

Case 1. Female, age 39. Chronic rhinitis, nasopharyngitis, O.M.C.C. both. Under treatment a number of years, temporary benefit only by use of catheter. Nose and throat treated with benefit. Complaint of sense of stuffiness in ears from time to time. Catheter and bougie show tubes swollen, high pitched auscultation sound. Began treatment with Meyer-Rowan instrument on May 29th, 1915. Before use, whispered voice, right and left ear, eight feet. Treatment given at weekly intervals. June 11th, whispered voice, right ear, after treatment, eighteen feet. September 17th, whispered voice before treatment, right and left, eighteen feet. Patient states that she is hearing excellently except during damp weather. From fifteen to twenty treatments given at intervals of from five days to a week.

Case 2. Female, age 27. Chronic rhinitis, O.M.C.C. both. Both drums decidedly retracted. C fork lost by aerial conduction. Schwabach positive. Whispered voice before treatment, eighteen inches right, three inches left. Tube mouths swollen, catheter shows restricted inflation in both ears. Treated with catheter for two weeks with improvement to hearing. Inflation shows tubes open. Treatment with Meyer-Rowan instrument begun November 16th, 1915. Before treatment, whispered voice, right ear, thirteen feet, left ear, four feet. After treatment, whispered voice, right ear, fifteen feet, left ear, five feet. Treatment continued at weekly intervals, in all, ten to twelve treatments given. April 4th, 1916, patient reported hearing excellent, great improvement noticed since beginning of treatment by auditory re-education.

Note: In this case, the improvement subjectively was out of proportion to the objective findings. The patient at conclusion of treatment was hearing right ear, ten feet, left ear, three feet, as compared with the record of January 14th, when she heard eighteen feet in the right ear, and five feet in the left. In our opinion this is to be explained by the difference in the intensity of the whispered voice in spite of the careful

attempt to obtain the same tone on every examination.

Case 3. Female, age 32. Otosclerosis, right and left. First seen June 10th, 1915. Hearing getting worse, especially in left ear, for a number of years, following birth of last child. Drum membranes normal, tubes wide open, no history of colds, general health good. Nose negative, bone conduction greater than aerial conduction. Whispered voice, nine feet right, six inches left. Acoumeter, fifteen feet right, one inch left. Treatment with Meyer-Rowan instrument begun June 18th, externally. After three minutes, whispered voice, twenty-four inches left. June 22nd, after treatment, whispered voice, left ear fifty-five inches; July 14 before treatment whispered voice left ear sixty inches, right ear eighteen feet. After treatment, whispered voice, left ear ten feet. Treatment continued at irregular intervals interrupted by illness. In all, twenty-five treatments extending over nine months were given. April 11th, 1916, before treatment the whispered voice was heard nine feet; April 19th, before treatment, whispered voice eleven feet, left ear, eighteen feet plus (capacity of room) right ear.

Case 4. Male, age 47. Chronic pharyngitis, chronic rhinitis, O.M.C.C. both. Both drum membranes showed marked retraction, calcareous mass left drum; drum membrane movable with Siegle, right and left. Tubes normal. Complaint of slow progressive loss of hearing, extending for number of years. Had been treated sometime before with benefit. Whispered voice, right ear nine feet, left ear eight feet. Treatment with Meyer-Rowan instrument begun June 18th, 1915. Improvement in hearing noted after treatment. June 25th, Wasermann, plus two. Specific treatment instituted. July 2nd, whispered voice before treatment fifteen feet right and left. July 9th, hearing improving. July 12th, whispered voice before treatment, fifteen feet right and left. Patient disappeared from treatment, therefore no opportunity for subsequent tests.

Case 5. Female, age 50. O.M.C.C. both. History of deafness in right ear for many years, tinnitus in left ear. Reflex lost in left drum, right m.m. much retracted. Whispered voice, right ear six inches, left eighteen inches. Bone conduction better than aerial conduction. Low C lost in both. Treatment with Meyer-Rowan instrument begun February 15th. March 18th, noise less. March 29th, hearing much better, whispered voice thirty-six inches right, twelve feet left. April 19th, hearing right ear normal. Tinnitus decidedly better.

Case 6. Male, age 26. Otosclerosis right and left. Gradual loss of hearing for three or four months. Submucous resection for relief of nasal obstruction. Drum membranes normal, tubes open. Low C lost in both. Upper limit to tuning fork normal, whispered voice, right ear thirty inches, left ear three inches. June 24th, began treatment with Meyer-Rowan instrument. After treatment, whispered voice forty-eight inches right and left. July 6th, before treatment, whispered voice five feet left, five to six feet right. July 14th, whispered voice before treatment, seven feet right, five feet left. Bi-weekly treatments given for three months. Hearing greatly improved. Treatment discontinued, improvement lost. Resumed treatment October 12th. Hearing improved. October 16th, hearing improved. November 3rd, hearing much improved. Whispered voice after treatment, four feet left, nine feet right.

Case 7. Male, age 70. O.M.C.C. Impaired hearing for years. Drum membranes much retracted. Eustachian tubes open. Treatment to left ear only. Before treatment, whispered voice two inches. Treatment with Meyer-Rowan instrument begun April 20th, 1915. Acoumeter not heard. Bi-weekly treatments given for one month. May 7th, whispered voice after treatment, six to eight inches. May 14th, no appreciable change in hearing.

Note: This is one case of failure which in all honesty cannot be regarded as surprising in view of the age of the patient, the duration of the disease and the great reduction in the hearing.

Case 8. Male, age 53. Beginning O.M.C.C. Intumescent rhinitis. History of slight difficulty in hearing right ear, for several months. Drum membrane right shows calcareous mass in lower part. Eustachian tube open. Low C lost. Whispered voice nine feet; acoumeter three inches.

Treatment with Meyer-Rowan instrument begun February 21st through auditory canal. Hearing improved. February 25th, whispered voice before treatment, fifteen feet. March 22nd, acoumeter six inches right ear, whispered voice twenty-five feet.

Case 9. Male, age 60. O.M.C.C. residuosa. History of suppuration. Drums show large perforations. Right ear dry, left ear slight discharge from time to time. Up to ten months ago heard well in left ear, never heard with right. Tinnitus pronounced and excessive in left ear. Eustachian tube mouths swollen. Whispered voice heard in left ear three inches, right ear after inflation, double numerals, four feet. No change in left ear. January 4th, began treatment with Meyer-Rowan instrument. Hearing continued to improve in right ear, whispered voice forty-two inches, spoken voice ten feet. No improvement in left ear. Treatment continued for a number of months. No change in tinnitus or hearing in left ear. Right ear improved in hearing, improvement maintained for a period of from four to five days. As much benefit seemed to be secured from simple inflation as from Meyer-Rowan instrument.

Note: The case is to be regarded as a failure so far as auditory re-education is concerned.

Case 10. Male, age 54. Otosclerosis, right and left. Gradual loss of hearing for ten years or more. No history of heredity. Eustachian tubes open. Tube mouths somewhat swollen. Drum membranes shown by Siegle to be bound down. Lower tone limit with tuning fork heard in right ear by bone conduction only, slightly in left ear. Upper tone limit normal. Before treatment whispered voice heard right eighteen inches, four inches left. Remains of adenoids in nasopharynx removed July 6th. Meyer-Rowan treatment begun June 29th. July 2nd, whispered voice right ear before treatment, nine to ten feet, left ear eight inches. After treatment (three minutes with Meyer-Rowan instrument), whispered voice, twelve feet right, left twenty-four inches. July 9th, improvement in hearing maintained. Whispered voice before treatment eighteen feet plus (capacity of room). Tinnitus formerly complained of much less. Weekly treatments covering periods of three months at a time continued for nine months. July 27th, hearing maintained right ear, left twenty-four inches. After treatment, voice heard across room right, left five feet. January 14th, after two weeks' interval, whispered voice right, across room; left three feet.

Case 11. Male, age 43. O.M.C.C. History of impaired hearing five years; treated for stomach trouble. Schwabach positive. Tubes narrow to catheter, poor inflation, move freely with Siegle. Whispered voice six inches right, fifteen inches left. After inflation, whispered voice eighteen feet right and left. November 17th, treatment with Meyer-Rowan instrument for one minute sharpened hearing. January 5th, hearing better, both tubes narrow. January 25th, whispered voice four feet right and left before treatment. After treatment with Meyer-Rowan instrument eighteen feet. Treatment continued at weekly intervals for two months. At first marked improvement, later improvement not maintained. Patient discontinued treatment. At time of last visit tubes were open and hearing right and left four feet.

Case 12. Female, age 39. Otosclerosis right and left. Childbirth always aggravated hearing. Treatment won't improve. History of impairment to hearing four years, no tinnitus. Tubes wide open. Drum membrane shows some retraction. Low limit lost left ear, C fork heard twenty seconds by bone conduction only left, upper normal. Right, Bezold fork heard poorly, C fork nineteen seconds by aerial conduction. Right ear whispered voice normal, left four inches; acoumeter twelve feet right, thirty inches left. Treatment with Meyer-Rowan instrument instituted March 5th, 1915. March 27th, hearing steadily improving. April 30th, whispered voice eighty inches left, acoumeter thirty to forty inches left. May 14th, hearing improving. May 21st, before treatment, whispered voice heard across room. Treatment stopped to resume in spring. During interval severe cold, hearing became poor. Treatment resumed. Acoumeter left two inches, right normal. Whispered voice left thirty-six inches. After treatment, whispered voice left six to seven feet. March

8th, after treatment whispered voice twenty feet. April 7th, hearing maintained, whispered voice before treatment twenty feet.

Case 13. Male, age 16. O.M.C.C. Adenoids and tonsils. History of repeated colds. Boy has been under treatment for number of years. Adenoids and tonsils removed. Politzerization temporarily improved hearing. Drum membranes retracted. Tone, lower limit, C2 fork. Whispered voice when first seen, six feet right, thirteen feet left. From time to time tubes become obstructed. Began treatment with Meyer-Rowan instrument, January 31st, 1915. Before treatment whispered voice right, six feet, left eight feet. After treatment whispered voice twelve to fifteen feet left, nine to eleven feet right. February 26th, hearing reported as good in spite of cold. Tubes found swollen to catheter. Weekly treatments for two months. Hearing continued to improve, whispered voice right and left ear eighteen feet.

Case 14. Male, age 41. O.M.C.C. residuosa. Radical mastoid several years before. Recurrent deposit of detritus in canal with small amount of pus from time to time. Eight treatments given with Meyer-Rowan instrument. No change in amount of discharge.

Case 15. Male, age 44. Otosclerosis left. Case has been under treatment for a number of years. Gradual loss of hearing in left ear. Drum membrane normal. Tube open. Whispered voice left ear, October 21st, 1915, double numerals, three inches. Treatment with Meyer-Rowan instrument begun, treatments given weekly for two months. Only slight improvement obtained. Treatment discontinued on patient's initiative. Case considered a failure.

Case 16. Female, age 62. Chronic rhinitis, O.M.C.C. History of abscess when a child; increasing deafness for last fifteen years. Whispered voice, right ear, before treatment, five feet; after catheterization, ten feet. Left ear, before catheterization, zero; after catheterization, six inches. Tubes freely open to catheter. Treatment with Meyer-Rowan instrumnt begun June 9th, 1915. Right ear fifteen inches before treatment, left ear six inches. Tubes wide open. After treatment three minutes, whispered voice, right, thirty-six inches, left, fifteen inches. Treatment given at weekly intervals. June 19th, after treatment, right ear, ten feet left ear, six inches. Treatment discontinued. Seen three months later, improvement not maintained. Patient undoubtedly improved while under treatment.

Case 17. Female, age 49. Otosclerosis left. Gradual onset, previous treatment of no avail. For two years very deaf. Eustachian tube open, hears loud voice only. November 30th, 1915, began treatment with Meyer-Rowan instrument. December 15th, hearing slightly improved. January 18th, before use of instrument, hearing poor. After treatment decidedly improved; spoken voice two feet. January 21st, hears better; January 22nd and 30th, patient thinks hearing is better.

Note: Treatment undoubtedly improved patient's hearing in left ear in spite of case being unfavorable one. This was one of our earlier cases. If we were treating it to-day we would certainly advise a longer course of treatment than was given.

Case 18. Male, age 40. Eustachian tube catarrh. Complaint of feeling of stuffiness in ears, drums normal, tubes open. Whispered voice fifteen feet right ear. History of stomach trouble. Nose stopped up. Treatment with catheter shows swelling of tubes. Treatment with Meyer-Rowan instrument was begun December 23rd. February 11th, report that ears had been comfortable since previous visit. March 11th, ears found O. K.

Note: The benefit in this case cannot rightly be ascribed to the Meyer-Rowan instrument altogether, which was used not more than three or four times. Treatment was also carried on by means of correct medication to the tubes and special treatment given by a stomach specialist. At the same time we feel that the Meyer-Rowan instrument is in part accountable for the improvement. It has been repeatedly recognized that auditory re-education has the effect of toning up the relaxed and swollen condition of the Eustachian tube.

Case 19. Female, age 55. Otosclerosis right and left. Deaf for a number of years. Whispered voice five feet right, zero left. Operative work on nose. Treatment with Meyer-Rowan instrument begun January 30th, 1915, and continued at intervals of four or five days for a period of two months. No appreciable improvement noted. Treatment discontinued.

Case 20. Male, age 53. O.M.C.C. Impaired hearing for number of years right ear. Acoumeter six to eight inches right, twenty inches left. Whispered voice twenty to twenty-four inches right, normal left. Left drum normal, right much retracted. Meyer-Rowan treatment instituted April 4th, given three minutes. Hearing much improved. Whispered voice forty-eigth inches right. Tinnitus previously complained of much better. April 19th whispered voice five to six feet. Patient steadily improving, noise much less.

Case 21. Female, age 60. O.M.C.C. Hearing lowered for some years. Drum membranes thickened and retracted. Tubes open. Poor digestion. Whispered voice thirty-six inches right, forty-eight inches left. Meyer-Rowan treatment begun March 29th. Buzzing noise previously complained of better. Head clearer. Whispered voice left and right after treatment, five feet left, four feet right. Patient still under treatment. Whispered voice, April 14th, six feet right, three feet left. Have been periods of return of noise with stuffiness of tubes. Patient shows undoubtedly by tests appreciable improvement in hearing.

Case 22. Male, age 65. Otosclerosis. Impaired hearing for years, occasional treatment. March 19th, 1915, acoumeter seven inches right, zero left. Tubes wide open. After catheter, whispered voice four inches left. Meyer-Rowan treatment begun. Whispered voice after treatment, eighteen inches left, eight inches right. March 20th, spoken voice heard distinctly across room. Patient satisfied with improvement.

Case 23. Female, age 26. O.M.C.C. with tinnitus. Local treatment, applications to nose and throat, catheterizations, failed to relieve noise. Meyer-Rowan treatment begun December 22nd, 1915. Tinnitus ceased following treatment. Had been present for number of years. Hearing much improved, April 13th. Treatment resumed. Tinnitus always better following treatment. Patient discharged with noise no longer in evidence.

Case 24. Male, age 13. O.M.P.C. Discharge from both ears for years. Hearing greatly reduced. Presented himself not for treatment for discharge which was not giving trouble, but for difficulty in hearing, especially in school. Whispered voice before treatment, thirty-two inches right, twenty-four left. Treatment with Meyer-Rowan instrument begun April 10th. After first treatment, whispered voice right, twenty feet, left ten feet. April 18th, after treatment, whispered voice right and left ear, twenty feet.

Case 25. Male, age 55. Tinnitus. Complaint of nasal catarrh. Impaired hearing subjectively, tinnitus intermittent in left ear three months. Meyer-Rowan treatment begun April 11th, at intervals of five days, four treatments altogether. Noise now almost entirely stopped, hearing excellent.

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"Crossed" Aphasia. BYROM BRAMWELL, *Edinburgh Med. Jour.*, May, 1916.

In right-handed persons the "leading" or "driving" speech centers are situated in the left hemisphere of the brain, and *vice versa*, in left-handed persons (but probably less constantly) in the right hemisphere. Consequently when marked and persistent aphasia occurs in a left-handed person, the lesion is situated in the left hemisphere and the hemiplegia is left-sided and *vice versa*. But in rare and very exceptional cases an attack of right-sided hemiplegia in a left-handed person is attended with aphasia. This Dr. Bramwell terms "crossed" aphasia. The explanation for this lies in the fact that the cortical centers in the "non-leading" or "non-driving" side of the brain, which correspond to the speech centers in the "leading" or "driving" side of the brain, are possessed of some degree of speech function, carried on in conjunction with, and in subordination to, the function of the speech centers in the "leading" or "driving" hemisphere. Dr. Bramwell reports a case tending to show that the "driving" speech centers in a right-handed person may, in consequence of the patient becoming left-handed from injury and disuse of the right hand, be transferred from the left to the right hemisphere. P. F.

SOME NOTES ON THE EXPERIMENTAL TREATMENT OF THREE CONGENITALLY DEAF CHILDREN WITH SONOROUS VIBRATIONS.

DR. LESTER MEAD HUBBY, New York City.

Case 1. M. C., female, age 14. Congenitally deaf. Father had syphilis. Deafness attributed to grip and pneumonia, which occurred at the ages of two weeks and again at nine months. The Wassermann reaction was positive two and one-half years ago but was now found to be negative. The patient has had one dose of salvarsan. Never gets seasick. Adenoids have been removed three times and the tonsils once. On examination the membranae tympani appeared normal and there was some chronic rhino-pharyngitis.

Hearing Tests. Using a cricket (a bent piece of spring steel, held loosely in a socket, which makes a loud sound on bending), the right ear heard it at a distance of .095 m., the left apparently at .025 m.

With the Zünd-Burguet electrophone as a noise-producer applied to the right ear, the left ear could not hear a loud wooden whistle or the cricket, but seemed to hear shouted *o*. With the Struycken-Schaefer monochord no tones were heard by air conduction. By bone conduction there was perception from the 400 d. v. to 625 d. v. over the right mastoid antrum, and 400 d. v. to 550 d. v. over the left mastoid antrum. In testing with the lower tuning-forks, the right ear perceived as low as 90 d. v. by air conduction, but could hear none of them by bone conduction.

The left ear could hear none of these forks by air or bone conduction. With the trigger, C fork, normal Air 90″, Bone 45″, the right ear was Air 20″, Bone 12″, and the left, without using any noise apparatus, was Air —, Bone 8″. With the trigger C_4 fork, normal Air 25″, Bone 18″, the right ear heard by air conduction at a distance of .045 m. at the moment only of releasing the trigger. The left ear in the same way heard by air conduction at a distance of .01 m.

Prof. Wright had been treating her ears, in a re-educational way by shouting in her ears, so tests were made with shouting the vowels *A, O* and *E* and these were rightly guessed at the following distances from the ears:

Right ear, A, .12 m.; *O,* .125 m.; *E,* .105 m.

Left ear, A, .115 m.; *O,* negative; *E,* .09 m.

Vestibular nerve, caloric and rotational tests. Caloric (cold) *test*: Right ear, no nystagmus after six minutes; no vertigo; no pointing error with either arm; left ear (cold), after four minutes there was hyperphysiological nystagmus to the right on extreme deviation of the eyes to the right. Pointing errors to the left with both arms at the first attempt only.

Rotation to the right ten times in 20 seconds produced nystagmus for 16 seconds; to the left, nystagmus for 17 seconds. She said she was dizzy after both rotations.

The right vestibular nerve is probably non-functionating.

Romberg was negative. Her *gait* was normal with her eyes open or closed.

She was treated with the Zünd-Burguet electrophone twice a day on school days, and once a day on Saturdays and Sundays, for forty-seven treatments, each treatment lasting about three minutes.

She was started with the mediumly loud vibrations (3 6/13), worked up to 4 12/13 and finally reduced to 1 6/13 to 1 12/13, with the following results as tested with the cricket for the right ear:

	Dosage	Before treatment	After treatment
January 30, 1915	3 10/13	.105 m.	.095 m.
February 3, 1915	4 12/13	.085 m.	.075 m.
" 6, 1915	3 6/13	.105 m.	.095 m.
" 11, 1915	2 6/13	.09 m.	.08 m.
" 12, 1915	1 6/13	.08 m.	.08 m.
" 16, 1915	1 6/13	.08 m.	.08 m.
" 18, 1915	1 10/13	.10 m.	.10 m.
" 23, 1915	1 12/13	.07 m.	.08 m.

The dosage of 4 6/13 and over may have produced headache as she developed the latter at that time, seemingly without other causes.

From the above tests the hearing for the cricket was stationary or improved only on the dosage of from 1 6/13 to 1 12/13.

After forty-seven treatments (nine appointments were missed on account of cold, etc.), the following tests were made for the right ear:

Cricket heard at a distance of .095 m.

Lower limit by air conduction 85 d. v.

C fork heard 15 seconds by air, only feels it by bone conduction.

C_4 trigger on release heard at a distance of .035 m.

Shouted vowels heard, *A*, .10 m.; *O*, .185 m.; *E*., .10 m.

The island of perception for high notes was 380 d. v. to 548 d. v. as compared to 400 d. v. to 625 d. v. at the start. Whether long treatment with a low dosage would have produced better results could only be known by trial.

Case 2. E. G., female, age 12. Family history unknown except that the parents were first cousins. The child is congenitally deaf. There is no history of attacks of vertigo. She has tendency to shuffle her feet, and her gait, forward and backward, with the eyes closed, is faintly suggestive of the duck walk.

The left membrana tympani has a slight ground glass appearance, otherwise both drums are normal. There is some chronic catarrhal naso-pharyngitis. Very slight adenoids are present in the vault of the pharynx. The right tonsil is moderately hypertrophied.

Hearing Tests. The cricket is heard by the right ear a distance of .085 m. The left ear is totally deaf when the Zünd-Burguet electrophone is used as a noise producer applied to the right ear. The Struycken-Schaefer monochord is not heard by either ear by air or bone conduction.

The C_4 trigger fork is heard as the trigger is released near either ear, the left ear undoubtedly through bone conduction to the other ear, as it was not heard when the noise apparatus was used. The lower limit of perception for the right ear is 50 d. v. by air conduction, and 55 d. v. by bone conduction.

The results with the shouted vowels (no noise apparatus being used) were curious. They were guessed at the following distances:

Right ear, *A*, .35 m.; *O*, .19 m.; *E*, .435 m.

Left ear, *A*, .38 m.; *O*, .43 m.; *E*, .23 m.

The guesses were therefore better for shouted *A* and *O* for the totally deaf ear (left) than for the very slightly hearing right ear.

The *caloric* (cold) *test* for the right ear produced very faint nystagmus after five minutes' application and on extreme deviation of the eyes to the left. There was no dizziness. With the left ear there was a slight hyper-physiological nystagmus in both directions on turning the eyes first in one direction and then in the other, after thirty seconds' application. There was no dizziness or increase of the nystagmus after five minutes' application of the test.

Rotational tests were negative to the right and to the left, ten times in 20 seconds, and also ten times in 10 seconds. She said she was slightly dizzy at the end of each of the rotations. The *vestibular nerves,* however, can be said to be practically unresponsive.

The child was given fifty treatments at the same intervals as in case M. C. She only missed four appointments during the course on account of colds, etc. She was started with mediumly loud vibrations, 3 12/13, and worked up to 5 2/13, with the following results, for the right ear, as tested by the cricket:

	Dosage	Before treatment	After treatment
January 30, 1915	3 12/13	.065 m.	.08 m.
February 3, 1915	5 2/13	.075 m.	.075 m.
" 6, 1915*	3 12/13	.07 m.	.055 m.
" 11, 1915	3 12/13	.06 m.	.065 m.
" 12, 1915	3 10/13	.065 m.	.065 m.
" 16, 1915	3 12/13	.065 m.	.065 m.
" 18, 1915	3 12/13	.06 m.	.07 m.
" 21, 1915	3 12/13	.13 m.	.12 m.
" 22, 1915	3 12/13	.12 m.	.15 m.

On February 28, after fifty treatments, the following results were obtained on testing the right ear: The cricket was heard .075 m. C_4 fork was heard only on releasing the trigger near the ear by air conduction. The lower limit was 55 d. v. by air and bone conduction. C fork heard 15″ by air conduction. C_4 fork on release of trigger heard at a distance of .065 m. Shouted *A* heard at distance of .315 m.; *O*, .38m.; *E*, .31 m.

The only improvement noted was the length of time of hearing the C fork, from 10″ to 15″.

Case 3. C. P., male, age 10. He is congenitally deaf in both ears. The family and past histories are not known.

The membranae tympani are normal. He has chronic catarrhal naso-pharyngitis, but there are no adenoids or hypertrophied tonsils.

The cricket, held behind my back was heard in the right ear at a distance of 3 m., in the left ear, .92 m. The left ear heard the cricket held in front of me, the other ear being closed with the finger, at a distance of 8.03 m. The upper tone limit with the Struycken-Schaefer monochord was 18500 d. v. right by air conduction, 14500 d. v. in the left ear.

With this instrument there seemed to be three islands of perception, 600 d. v. to 680 d. v., 1500 d. v. to 2700 d. v., and 5500 d. v. to 18500 d. v. in the right ear, and one island in the left ear, namely 5500 d. v. to 14500 d. v.

The low limit with the Bezold forks was 17 d. v. for both air and bone conduction on the right side, and 23 d. v. for air and 17 d. v. for bone on the left side.

The C fork (normal, Air 90″, Bone 45″) was 30″-25″ for the right ear, and 17″-20″ for the left ear.

The C_4 fork (normal, Air 25″, Bone 18″) was 9″-11″ for the right ear and 5″-11″ for the left ear.

The C fork was lateralized to the left ear.

*Was ill on that day.

Rinné was positive on the right and negative on the left side.

Conversationally spoken vowels were heard at the following distances, for the right ear, *A*, .12 m.; *E*, .235 m., and *O*, .42 m.; for the left ear, *A*, .04 m.; *E*, .04 m., and *O*, .045 m.

Shouted *O* was made out on the right side at a distance of 7 m.

The *caloric* (cold) *tests* gave the following results: With the right ear nystagmus occurred in 35 seconds and lasted over two minutes. With the left ear nystagmus occurred only on extreme deviation of the eyes (first degree) in one minute and did not increase on continuation of the irrigation for five minutes. Nystagmus was still going eight minutes later and this disappeared five minutes later after the treatment with sonorous vibrations.

Rotation to the right 10 times in 20 seconds produced nystagmus for 10 seconds; to the left, nystagmus for 12 seconds. The left vestibular nerve is therefore only slightly functionating.

He was given forty-nine treatments with the Zünd-Burguet electrophone in the same manner as with the previous two cases. On account of colds, etc., he missed five appointments during the course.

He was started with 2 6/13 dosage, worked up to 5 2/13 and then reduced to 4 4/13.

During the course the tests for the cricket held behind my back for the right ear, and in front, for the left ear, the other ear being closed with the finger, were as follows, before and after treatment:

	Dosage	Right ear before treatment	After treatment	Left ear before treatment	After treatment
January 30, 1915	4 4/13	3.51	4.88	8.03	9.60
February 3, 1915	5 2/13	4.81	4.85	8.80	9.30
" 6, 1915	4 4/13	4.61	5.42	9.55	10.50
" 21, 1915*	4 4/13	3.26	5.25	8.66	11.67
" 22, 1915**	4 4/13	7.60	8.89	6.25	10.72

After the forty-nine treatments, the ears were retested with the following results: The cricket was heard by the right ear 10.62 m., by the left ear 9.93 m. Behind the back the right ear heard the cricket 4.05 m. Two of the islands of perception for high notes gave slightly different results from those before the course, namely,

*Had a bad cold from the 14th to the 22nd.

**Cricket held in front of me, not behind my back.

597 d. v. to 630 d. v. and 1230 d. v. to 2700 d. v. for the right ear. The upper limit for air conduction was 18500 d. v. right and 14500 d. v. left ear. The upper limit for bone conduction was 19500 d. v. right and 16000 d. v. left ear. The low limit for the right ear was still 17 d. v. though he thinks he only feels the fork by bone conduction. On the left side the low limit is 24 d. v. by air conduction and 17 d. v. by bone conduction.

The C fork on the right is Air 25″, Bone 25″, on the left, Air 18″, Bone 26″.

The C_4 fork on the right is Air 9″, Bone 5″; left, Air 9″, Bone 8″.

Weber no longer lateralizes to the left side. Conversationally spoken vowels heard in the right ear at a distance of, *A*, .195 m.; *E*, .195 m., and *O*, .335 m.; in the left ear *A*, .09 m.; *E*, .16 m., and *O*, .31 m. Shouted *O* was now heard 10 m.

Although there was improvement as shown by the cricket and some of the other tests, yet the most encouraging feature in this case was the response to the treatment each time it was tested before and after.

Thus the right ear increased 39, .8, 17, 61 and 17 per cent respectively, immediately after treatment or an average of 26.9 per cent; and the left ear increased 19, 5, .9, 34 and 71 per cent respectively, or an average increase of 25.9 per cent.

The results in these three cases of severe deafness (total loss of hearing in two out of the six ears tested), are not encouraging so far as sufficient improvement of the hearing to be of any practical benefit is concerned, yet it would seem that the treatment would be of value in inculcating the concept of tone and so of inflection in those just beginning to learn to speak.

27 West Sixty-eighth Street.

Simple Method of Obtaining Ragweed Pollen in Large Quantities.

R. P. Woodhouse, *Boston Med. and Surg. Jour.*, March 23, 1916.

The flower heads from the young plants just coming into bloom are stripped and after being allowed to become almost dry they are crushed in a mortar with several volumes of carbontetrachlorid. After thorough maceration the liquid is strained off through muslin. Most of the pollen, liberated by crushing from the anthers, passes with the CCl_4 through the muslin and can be collected on filter paper.

P. F.

PRESENT STATUS OF CARCINOMA WITH SPECIAL REFERENCE TO THE HEAD AND NECK.*

Dr. Joseph C. Beck, Chicago.

If I were to state that the status of cancer as to cause, diagnosis and treatment is the same to-day as it was twenty years ago, I would not be very far from the truth, because all the tremendous efforts on the part of the medical profession have not yet proven any specific cause, or more definite diagnostic measures other than microscopic examination and surgery, recognized then as now, as the only means of combating the disease. From this statement of fact one might assume that there is very little use in expending all this energy on such a hopeless problem as the study of carcinoma.

To me this hopelessness seems to be borne out by my experience in over four hundred cases of carcinoma of the head and neck that I have treated in the past twenty years. Nevertheless, it is of great interest to chronicle the work that is being done in the study of carcinoma and only these untiring efforts by scientific co-workers will, I hope, bring forth the much desired results in finding the cause and treatment of this disease. It has been my lesson to watch what is being done in carcinoma in every possible way, and I have been constantly on the alert to apply this information in my practice. Rather than doing any original or research work, I have been attempting to prove or disprove the many suggestions offered, particularly regarding treatment. In this connection I would like to call attention to some of my publications presented before the American Laryngological, Rhinological and Otological Society. In 1904, "On the Use of Radium in Carcinoma of the Nose, Throat and Ear." In 1905, "Further Observations on the Action of Radium, X-rays and Fulguration in Carcinoma in Ear, Nose and Throat Affections." In 1912, "Carcinoma of the Larynx with Special Reference to Radium Therapy." In 1912, "Autolytic Serum in Inoperable Carcinoma with Report of Cases." In 1913, "Report and Presentation of Cases and Specimens of Resection of the Upper and Lower Jaws in Cases of Carcinoma." In 1915 I made a resume of the "Methods of Treatment by Non-Surgical Means in Cases of Inoperable Carcinoma for the Past Twenty Years."

To-day I wish to make a further report on our work on carcinoma as regards etiology, diagnosis and treatment.

*Read before the Middle and Western Sections of the American Laryngological, Rhinological and Otological Society, St. Louis, Mo., Feb. 22, 1916.

Etiology. It is not my purpose to go into the discussion of the various theories advanced, nor to take up your valuable time in presenting our experiments in any great detail. It will suffice for me to give you the conclusions we have reached and anyone especially interested may find the report in the Transactions of the Chicago Pathological Society, No. 2, Vol. X, 16, or may come to our research laboratory in Chicago, where this work is being carried on under the supervision of Dr. M. Buchsbaum. We wish to state emphatically that this report is strictly one of work that has been

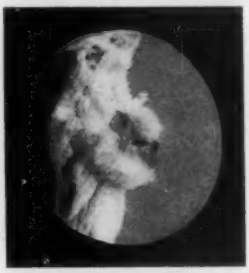


Fig. 1.

Fig. 2.

Fig 3.

Fig. 4.

done, and no claim whatsoever is made that a definite cause of carcinoma has been proven.

CONCLUSIONS OF BUSCHBAUM'S WORK.

1. That an organism which grows on ordinary culture media can be found in carcinomas removed at operation from areas not accidentally contaminated.

2. That this growth has a characteristic color, appearance (presentation of test tube).

3. That when examined under the microscope it represents a torulla or yeast cell (presentation of the slide; the same under the microscope).

4. That when pure culture is injected into mice and rats a tumor results whose characteristics are epithelial and diagnosed as carcinomatous (presentation of microscopic specimen).

5. Such animals die of metastases and rapid emaciation (presentation of mice). (Fig. 1 and 2.)

6. Blood examination (for Abderhalden and complement fixation tests) is positive of cancer of these infected mice and rats.

7. That when these tumors of the mice and rats are examined they contain the same organism which can be reinoculated into other mice that develop the same growths.

8. The number of mice and rats infected by these organisms develop cancer in much larger per cent than in other experiments, for it must be remembered that cancer has been developed in mice and rats by others and by other methods but in smaller percentages.

9. These cultures have been subjected to various chemicals and rays and found that they are resistant. They are only retarded in

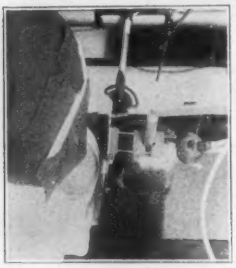


Fig. 5.

Fig. 6.

growth by the x-ray, radium and diathermia as ordinarily applied, but formalin particularly, is inimical to their growth. I am therefore using formalin locally and urotropin in large doses (100-200 gr. daily) internally to determine this fact in a practical way in some cancer cases.

10. That the coloring-matter that is found in the growth may play a great role in the causation of cancer. This is my own theory based upon the following facts: (a) We are all acquainted with the chimney sweep cancer, probably influenced by the black pigment; (b) the epithelial growth that follows the use of "Scarlet red" in ulcerative surfaces; (c) the same is true in "Malachite green" and Bismark Brown; (d) in connection with chronic suppuration of the ears in which there is a marked formation of epithelium that infiltrates the bone and grows beyond normal confines, known as cholesteatoma, we always find cholesterin which has a yellow color;

(e) following the injection of paraffin in cosmetic surgery there has developed in a great many instances what is known as paraffinoma which contains epithelium and may be due to the pigment impurities within the paraffin; whether it is the color or other chemicals is a question.

Diagnosis. As stated before, the microscopic diagnosis is still the only positive means to determine that a certain condition is carcinomatous. It is inconvenient, to say the least, to have to sub-

Mr. Bt. 1. Carcinoma of the lip; radically excised, including the glands of the neck.
Mr. Bt. 2. Several months after operation.

Mr. Vk. 1. Epithelioma of the lower lip. Treated by radium (10 mlgr.) pure, four applications, one-half hour each.
Mr. Vk. 2. Several months later; no recurrence.

ject a patient to the removal of a piece of tissue. Other aids in diagnosis are therefore always welcome. The Abderhalden test (serologic) has been performed by us in every suspicious case of cancer of the head and neck, for the last two and one-half years, in about one hundred cases and we found it to correspond with the microscopical and clinical findings in about 70 per cent of the cases. On account of the difficulty experienced with the dialyser in proving it efficient and owing to the inability at the present time of obtaining dialysers from Germany, and the fact also that at least 10 cc. of blood from an already weakened patient must be had, we

have developed a serological technic that not alone substitutes, but shows a greater percentage of positive results, corresponding to the clinical and microscopical findings. In the last two years we have made this test in about one hundred cases. This test is known as "compliment fixation for carcinoma," having been worked out and to be published in the *Münchener Med. Wochenschrift*, by Jakob Kobalter, laboratory director of the North Chicago Hospital. Its principles are analogous to the Wassermann test except that the

Mr. Js. 1. Epithelioma of the zygoma and orbit. Allowed to progress under the use of arsenic paste. Subsequently radically operated; finally died.

Mr. Hd. 1. Carcinoma of the lower jaw, floor of the mouth, tongue. Radical operation by means of Percy cautery, death following within one week.

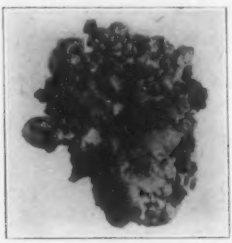
antigen is a mixture of all types of cancer instead of syphilitic substances.

We have further developed, under the suggestion of Jakob Kobalter, a test for carcinoma by examining the saliva. This test is based upon similar principles as the Lange test of the cerebro-spinal fluid. The main difference is that we employ silver-chloride instead of gold-chloride for the color standard. Fifteen cases of carcinoma

We have determined the value of the Davis haemo-urochrom test of the urine in more than three hundred cases of suspected carcinoma and found that it proved of value or gave a positive reaction in about

Mr. Akm. Cancer of the right tonsillar region involving the tongue, upper and lower jaw, soft palate, posterior wall of the pharynx including the mouth of the esophagus. Glands of the neck. Operated by the radical method (Percy) instrument used. Ligated the common carotids, owing to the involvement of the external and internal. Hemiplegia following almost immediately after operation. Patient recovered consciousness but died in forty-eight hours after operation.

Mrs. Boh. Carcinoma of the parotid. Metastases revealed in the case. Inoperable.



Mr. Hz. 1. Carcinoma of the soft palate, base of the tongue, and right tonsillar pharyngeal region. Radical operation, including the compression of the common carotid artery, since both external and internal carotids were involved in the glandular mass of the neck that was removed. The entire operation within the oral cavity was performed by the Percy method.

Mr. Hz. 2. Specimen removed. Patient died within three weeks after operation from a gradual asthenia, different from the usual cachexia. Post mortem failed to reveal further metastases in the usual locations.

60 per cent of the cases. The principle upon which this test is based is the elimination by the urine of the end toxin substances from the carcinoma.

After all is said, the clinical diagnosis still remains of most importance and that spells experience. One of the most frequent errors in diagnosis and oftentimes a fatal delay is the therapeutic test for syphilis. We have, and I know most of you have, seen cases of carcinoma subsequently proven that improved markedly for

Mr. Wt. 1. Rhinophyma with carcinomatous degeneration. Age 71 years. Operation.
Mr. Wt. 2. After operation, now six years. Still without recurrence.

Mr. Uhlg. Carcinoma of the upper jaw following epulis, partially resected, wide of the growth. Later subsequent deep x-ray therapy.
Mr. Uhlg. 2. Recurrence within three weeks. Secondary radical resection. Compression of the common carotid. Patient died within three months after operation.

a time following the use of anti-syphilitic treatment. Another therapeutic measure that has delayed an otherwise operable case while waiting for a diagnosis is the x-ray or radium treatment long continued.

Treatment. We are or should be of one opinion as to the rational treatment of carcinoma and that is radical surgery. Unfortunately, many cases come to us when the case has become inoperable so-called; metastases have already taken place or the involvement is so marked that the removal of all the tissues affected would make it

not worth while living—at least such patients are usually very unhappy. Another important point is the danger from implantation carcinoma following an operation. This has been particularly well brought out by Crile in his work on carcinoma of the larynx (the growth being within a closed box when removed). In the past two years we have made use of the actual cautery instead of the knife to prevent this implantation and to secure a destruction of every vestige of cancer cells within the neighboring lymph channels. I am

Mr. Abc. Epithelioma of the carotid region involving the superficial structures. Deep x-ray therapy with subsequent operation and plastic, as shown in Fig. 2.

Mr. Lrz. Carcinoma of the upper jaw following epulis. Radical resection of the upper jaw. Eight years ago. No evidence of recurrence. Mr. Lrz. Front view.

referring to the "Percy coagulation method." It was first advocated for the treatment of inoperable carcinoma of the uterus, but latterly has been used for other carcinomatous-involved structures. The apparatus consists of a rheostat, electrode, handle and tips and water-cooled speculum to prevent the cooking of the healthy neighboring tissues such as the tips, etc., in the work within the nasal, oral or pharyngeal cavity. (Fig. 3a.) I have added the long, slender tip in cases in which one wishes to work deep in the nose, pharynx and larynx. The nasal speculum is modified from the Allen, the mouth

speculum from the Brophy, and the laryngeal is developed along the lines of Lynch's spatula for suspension work. (Fig. 3b.)

In the cases of cancer of any flat surface about the head and neck, or the cases of cancer of the larynx, where one wishes to keep the surrounding tissues from scorching, I employ watercooling plates,

Mrs. Brk. Resection of the soft and hard palate for carcinoma. Glands involved. Operated radically three years ago. No recurrence.

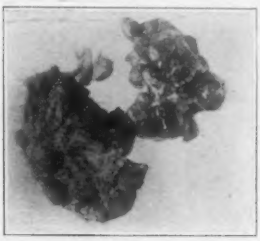
Mr. Ln. 1. Carcinoma of the anterior part of the tongue, floor of the mouth, including part of the lower jaw. Operation by Percy method.
Mr. Ln. 2. Several months later. No recurrence.

Mr. Ln. 3. Specimen of a sequestrum coming off several weeks after operation, due to recoagulation necrosis.

which are constructed a good deal like Leiter's cord. These are two crescent-shaped plates and by approximating them or overlapping at the cutout edge, one is enabled to make any size opening through which to operate. Aside from these plates and the three speculums mentioned above, I make use of a metal flexible tube car-

rying within its lumen a smaller tube through which cold water is permitted to flow. The purpose of this water-cooling tube is in cases of cancer of the larynx in which the Percy coagulation method is employed, to be passed into the upper part of the esophagus and thus prevent its anterior wall from becoming scorched. Our results with this method of treatment have so far promised to be the best.

Mr. Tk. 1. Cancer of the palate, involving the upper and lower jaws, floor of the mouth, base of the tongue, fixation of the skin over the entire side of the face. Marked glandular involvement. Ligation of the common carotid was necessary as well as allowing a large defect of the face. Patient developed a hemiplegia of the opposite side. Never rallied from operation. Died within twenty-four hours.



Mr. Tk. 2. Growth within the oral cavity including the face was entirely removed by the Percy method.
Mr. Tk. 3. Post mortem examination. Showing defect of the face. No metastases in usual place.

Radium. Since our last report which was based principally on carcinoma of the larynx and which we found absolutely negative in the deeply-involved structures, we have continued to employ radium in very superficial lesions with good results. We have discontinued its use in all other operable or inoperable carcinomas. I believe the reason for our negative results is due to the fact that the quantity of radium element is too small, namely, 10 milligrams. Attention should be called to the peculiar toxemia resulting when radium is used, even in the dose mentioned, especially if employed for a longer

period. Prof. Finger called attention to this fact several years ago and warned against the large doses of radium. Pre-operatively and post-operatively we still employ the radium, particularly in the larynx. Figure 4 shows the various appliances for radium therapy.

X-ray. Considerable progress has been made in the x-ray treatment of carcinoma, particularly in superficial lesions. Here, just as good, if not better, results are obtained than by means of radium.

Mr. Ks. Carcinoma of the larynx and esophagus. Lived three years under the use of x-ray and radium treatment. Post mortem revealed no metastases.

Mr. McK. Epithelioma of the auricle treated with arsenic paste by quack. Subsequently radically operated. Died six months later of metastases. Pains controlled by morphin, fifteen grains twice a day.

It is to the preparatory and post-operative application of what is known as the "deep penetrating (x-ray) therapy" by means of water-cooled tubes and filters that I wish to call your attention (Fig. 5). In every case of diagnosed or suspected carcinoma, before operation, even before the removal of a specimen for microscopic examination, we always have the patient receive this treatment for at least one or preferably two erythema doses, which may take a week or two. After the operation, as soon as the patient has recovered sufficiently, we again have him receive several erythema doses. So far as the use of the x-ray in inoperable carcinoma is concerned it has been our observation that no cures have been accomplished.

We have seen marked improvement and recessions in the growth but they were not lasting.

Diathermia. This comparatively new electric treatment (Fig. 6) of carcinoma has been heralded especially in the German literature as the possible cure of this affection. The principle of its action is a slow death of the epithelial cells, especially in a given area, very much like the rays of fulguration. The diathermic treatment is often applied preceding the application of deep x-rays. I have seen some

Mr. Wdl. Carcinoma of the larynx and bilateral involvement of the glands. Metastases in the lungs.

Mrs. Kg. 2. Post operative.

of the most striking results in the reduction, in fact disappearance, of a true carcinomatous growth only to be disappointed in seeing it return and finally lay the patient low. What surprises me are the wonderful reports of permanent successes in the medical well-thought-of books and journals of cured cases of cancer by diathermia. It seems to me it would be a good idea if a special society such as the American Laryngological, Rhinological and Otological Society or the Society for Prevention of Cancer would appoint a permanent committee, whose business it would be to investigate these cures, by going directly to the man who is reporting these cases, especially if he is a reputable surgeon. I know that such procedures

Mrs. K—. (Fig. stereo-photograph (cut out) demonstrating the value of this method of photographing. Showing size of projecting growth.) Carcinoma of the tip of the nose. Treated by an x-ray specialist, followed by rapid growth. Operation, under local anesthesia, by Percy cautery method.

have been and still are carried out by the American Orthopedic Society with special reference to curvature of the spine. This committee is made up of ten members, of whom at least one-half usually are able to meet, giving due notice to the gentlemen they are going to visit in order to see these results. As a result of this labor, one man's report of so many cures has been reported by this committee as the very opposite, viz., no cure at all. It is this self-hypnotization

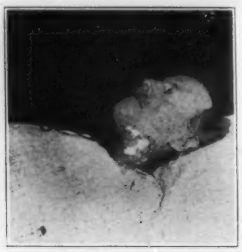
Mr. Mmn. Epithelioma of the lower jaw. Metastases about the liver, etc., proven by operation. Case inoperable.

Mrs. Jhsn. Carcinoma of the thyroid gland. Operated by Percy method under rectal anesthesia. Operation necessary owing to the patient's choking. Trachea impossible of reaching without removing the greater portion of the tumor. The incision as shown through the tumor was made about six months previous to time she presented herself to author, and personal communication with the operator elicited the fact that the operation had to be discontinued on account of the severe hemorrhage.

of the over-enthusiastic worker, especially after he has worked his way to recognition in the medical world, that fills our journals with literature that is not worth the paper it is written on. I do not wish to imply that it is done in any spirit of dishonesty whatever; it is simply a matter of judgment and this committee is the check on this judgment. Such committee is compensated by the Society only so far as traveling expenses are concerned.

The follow-up system of carcinoma patients is another step forward in this question. One should have a special calender (date-book) for the return of a case of carcinoma that has been operated upon and upon the failure of his or her showing up, a letter is written reminding the patient to do so. Bloodgood of Baltimore is responsible for this movement and the results from this propaganda are very favorably mentioned by the majority of surgeons pursuing

Mrs. McG. Carcinoma of the ala. Resection and immediate flap transplantation. Completely recovered five years since.



Mr. Fly. Carcinoma of the neck. Rapidly growing. No original point of infection demonstrated within the oro-pharyngeal-laryngeal cavity until shortly before death. When lowest part of larynx showed involvement.

it. As long as five years after operation one is required to be on a sharp lookout for recurrences. At first, patients report every six months, then yearly, but if at any time some manifestation has appeared the patient is required to come oftener. No hesitancy should be felt as to the ethics in writing people to come and see the doctor, because the question of cure of carcinoma is greater than ethics. Men interested in this particular side of the question say that when a patient presents himself for the first time and gives a history of

having been operated upon for carcinoma, it shall be the duty of this physician to make a report either known or unknown to the patient, to the surgeon who performed the operation as to the exact status of the patient. In other words, we need more enthusiasm in

Mr. Hgl. 1. Carcinoma of the larynx well advanced on both sides, but free esophagus. Percy coagulation method with cooling apparatus employed. Entire interior of larynx removed. Unable to swallow for six weeks following operation, but stomach tube passed easily.
Mr. Hgl. 2. Six weeks after operation; fissure closed; can now swallow and has a fair voice.

Mr. Rt. 1. Carcinoma of the larynx. After skin incision the entire operation of laryngo-fissure, excochleation of the tumor and well beyond it were performed by the Percy apparatus; no cooling of neighboring tissues was employed. Much reaction followed with some secondary sequestration of the right cartilage.
Mr. Rt. 2. Eleven weeks after operation; fissure united; good breathing; no evidence of recurrence.

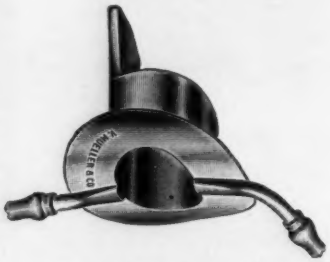
this cancer problem and every physician should put his shoulder to the wheel as they did when the question of tuberculosis was taken up, about twenty years ago. I am in favor of the establishment of cancer institutions and the organization of societies, particularly the

Society for Prevention of Cancer, so that there should be a reduction in this apparently increasing malady.

In conclusion I wish to say a few words as to my personal views about the indications for operation for cancer.

1. In superficial lesions especially about the hands and face, non-surgical, preferably radium and x-ray treatments should be given

Nasal speculum.



Oro-pharyngeal speculum.

Laryngeal speculum.
Figure 3b.

preference and if the results are not rapid and favorable, then remove thoroughly, with subsequent plastic.

2. In all other definitely diagnosed or strongly suspicious carcinomas the earliest and most thorough surgical intervention appears to me to be the only rational treatment. The so-called inoperable carcinomas I only recognize when either the patient's general condition would probably not warrant his survival from the operation or if the structures that have to be removed in order to cure the

patient, would make life not worth while living. Of course, we must always consider this last portion of the question relatively, because what we consider "not worth while living" may not be so considered by the patient and *vice versa*. We can, however, say that the non-operating on a patient with so-called inoperable carcinoma has a most dubious outcome and a correct picture should be made to the patient.

Let me digress here for a moment. I am absolutely opposed to telling the patient with the exception that if he have no relations or immediate friends that he has a cancer that cannot be cured, in fact, I prefer not to tell him that he has a cancer at all, for two reasons. One is because I believe it is distinctly depressing and the second is that it is heartless. Tell the nearest relative or friend that the chances from such an extensive operation are probably death on the table or soon after, but if recovery does take place then the carcinoma will probably not return. I never urge such patients to be operated upon but make it clear what the outlook is by palliative measures. In most instances, at least in the better educated class, they gladly consent to operation. You are not a hangman but a true physician if you operate such an otherwise hopeless condition and if only one case in one hundred recover you have one hundred per cent of recoveries, since the ninety-nine would die a worse death.

The illustrations represent some of the cases out of my practice, each one of which illustrates some of the points I have mentioned. They are not reported with any idea of showing cures, rather the opposite.

2551 North Clark Street

Deformities of the Jaws Resulting from Operation or Injury. Dr. Percival P. Cole and Dr. Charles Henry Bubb, *British Medical Journal*, Feb. 19, 1916.

Suitably constructed obturators made of vulcanite or aluminum and hollowed out where necessary to fill in large gaps are used to separate the nasal from the oral cavity and to restore the masticating surface as well as to restore the facial contour.

The cast interdental splint is infinitely preferable where it can be used and it has a wide range of application in fractures of the mandible. Stein.

IMRACTED FOREIGN BODY IN THE TRACHEA.*

Dr. C. J. Imperatori, New York City.

A. B., aged 18 months, was brought into St. Mark's Hospital on the night of December 19, 1915, suffering from extreme dyspnea, marked cyanosis and in a condition of collapse.

The parents said, that about one-quarter hour before, the child had been playing with a bead and had accidentally swallowed it.

Through the courtesy of Dr. J. G. Callison, the writer saw the case about one hour after the accident; the symptoms then being very marked respiratory obstruction and collapse.

While tracheotomy instruments were being sent for, oxygen was given and the cyanosis was somewhat relieved. A small laryngeal spatula of the Brunning type was introduced into the larynx and a foreign body was seen twirling around in the trachea, with each effort of respiration.

As the bead was turning in its long axis, just below the glottis—the only air that the child was getting was that which passed through the hole in the bead. An attempt was made to get the bead, but it was unsuccessful. Suddenly the child seemed to suffer an acute attack of dyspnea, and a tracheotomy was done with the successful removal of the obstructing body.

However, the child made but few respiratory efforts through the tracheotomy wound and succumbed within a few moments. During the period of the few moments after the tracheotomy, all methods available were instituted to resuscitate the child, and were continued for some time.

The reasons for presenting the case are the following:

The size of the foreign body. The bead was 11 millimeters in diameter. The trachea of several children the same age and development examined post-mortem were but few millimeters larger, while in some the trachea was much smaller.

To put this bead within the trachea of a dead child it required some force to push it past the vocal cords.

Before seeing the child, it had three severe attacks of dyspnea, evidently due to the bead slipping down the trachea to the bifurcation or getting into one of the bronchi. Probably, the attack of dyspnea was due to this same happening.

While the child was put in such a position that the feet were at least eighteen inches higher than the head, respiratory movements could very easily cause the bead to act as a ball valve and produce the above-noted symptoms. Immediate tracheotomy might have saved the child when brought into the hospital.

245 West 102nd Street.

*Read before the New York Academy of Medicine, Section on Rhinology and Laryngology, February 23, 1916.

DIFFUSE DIABETIC ULCERATION OF THE PHARYNX AND LARYNX.*

DR. HUBERT ARROWSMITH, Brooklyn, New York.

The rarity of this condition justifies the presentation of this brief report. Mrs. S., age 66, was seen in consultation with my friend and colleague, Dr. P. H. Sturgis, on February 29, 1916. For about a year she had suffered from gradually increasing dysphagia and for five months she herself could testify to an "eruption" in the throat, and had at times experienced regurgitation of fluids through the nose on attempted swallowing. She consulted Dr. Sturgis a few days before he brought her to me. Three negative Wassermann tests and several, also negative, sputum examinations, eliminated syphilis and tuberculosis. The appearances were not suggestive of either of these conditions, but with a positive Wassermann or sputum, undoubtedly the local lesions would have been considered rather atypical manifestations of lues or tuberculosis. Two examinations of smears by different pathologists showed only streptococci. Malignancy was rejected at once. Vincent's angina suggested itself but was abandoned before the pathologist's report negatived such a possibility. No lesion of the nature of pemphigus or erythema multiforme, would have existed on a mucous surface for five months without some cutaneous manifestations.

Recalling a patient observed about 1890, during my association with Dr. Benj. F. Westbrook, a master of laryngological diagnosis, a somewhat later similar observation of my own and Dr. Freudenthal's report of *five* observations of diabetic ulceration of the pharynx and larynx, I decided that this case belonged in that category. A twenty-four hour specimen of urine the next day showed between 4 and 5 per cent of sugar. No urine examination had been previously made. The patient was sent by Dr. Sturgis to his hospital, the Methodist Episcopal, in Brooklyn, and placed on the Allen scheme of treatment, with decided improvement as to her glycosmia, but, as I understand, without much change in her local condition.

There is no literature about the subject except Westbrook's report, which I know from personal recollection was published somewhere, though a recent search of the literature of that period in

*Read before the New York Academy of Medicine, Section on Laryngology and Rhinology, March 22, 1916.

the Academy library failed to reveal it, and Freudenthal's very minute and careful study of the five cases referred to, which appeared in the *Annals of Otology,* in November, 1899.

The text-books refer only to "pharyngitis sicca," as a local complication of diabetes as also does Friederich in his elaborate monograph on the relation of rhinology, laryngology and otology to general medicine (Leipzig, F. C. W. Vogel, 1899), published in the same year as Freudenthal's report, which evidently had not been brought to the attention of the author.

I assume that this is the seventh case of diabetic ulceration of the upper air-passages so far recorded—the sixth, unless further search reveals Westbrook's observation.

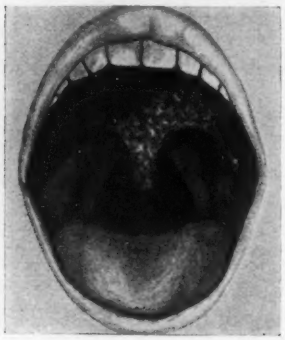


Fig. 1.

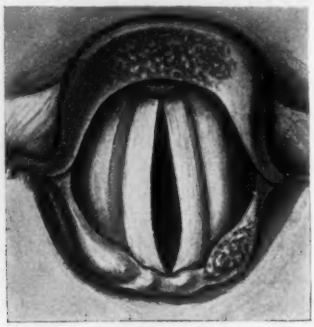


Fig. 2.

The condition must be rare.

There was ulceration of the uvula, velum and posterior pharyngeal wall, the laryngeal surface of the epiglottis and the right arytenoid. The conditions are very well represented in the pictures, the first of which is practically after nature, except that the relatively slight involvement of the posterior pharyngeal wall is sacrificed to bring into greater prominence the condition of the uvula and velum. The laryngeal picture is intentionally semi-diagramatic in order to show more clearly the contour and location of the ulceration.

The general condition of the patient made it impossible to present her in person at this meeting.

170 Clinton Street.

EDITORIAL DEPARTMENT

THE DEAF

Their Education—Improvement of Conditions—Responsibilities and Participation of the Profession.

JOHN DUTTON WRIGHT, M. A.
DIRECTOR OF THE WRIGHT ORAL SCHOOL FOR THE DEAF
NEW YORK CTY

RE-EDUCATION OF RESIDUAL HEARING.

In the July, 1916, number of THE LARYNGOSCOPE, there was published in this department an abstract of an article by Prof. Castellani, of Milan, dealing with the effort to re-educate a seriously impaired sense of hearing by means of mechanical apparatus, with special reference to the elaborate electrical appliance developed by Zünd-Burguet.

In this number we publish a detailed report by Dr. Lester M. Hubby, of New York City, of a series of long-continued tests of the Zünd-Burguet apparatus on three congenitally deaf children, each of whom had some residual power of sound perception.

The aim of all efforts to increase sound perception is, primarily, to give the patient a greater and easier comprehension of spoken language,—that is to increase the *usefulness* of the residual hearing.

This problem of increasing the usefulness of residual hearing in the comprehension of language through the ear in cases of severe impairment of audition is one of great importance and of deep interest to a large number of persons.

The problem involves two distinct parts. First,—the effort to increase the actual power of perceiving sounds within the range of the speaking voice, and second, the education of the brain to more successfully *interpret the meaning* of the imperfect sounds perceived. The successful solution of the first part of the problem would be merely preliminary to the solution of the second part and would not be likely to produce so complete a restoration of hearing as to render the second part of the problem non-existent.

It is only in connection with the improvement of audition that the Zünd-Burguet, or any other mechanical appliance, can be useful. When Dr. Castellani says, "It (the mechanical apparatus)

may give to perfection the sound of the human voice with the most delicate blendings of the musical scale, but *it does not give the vowels; it does not give the syllabic groups, and does not give the words and phrases,"* he touches upon the vital point where lies the limit of usefulness of all mechanical devices for auricular training. They may be used to supplement auricular training by spoken sounds, but they cannot replace the oral exercises in accomplishing the *real purpose* of such *training which is to increase an understanding of language through the ear.*

In the case of children who are seriously deaf from infancy it seems very rare that the results obtained by the aid of mechanical appliances are sufficient to render unnecessary supplementary educational exercises by means of the human voice. In the cases of adults whose power of sound perception may be increased by mechanical auricular exercises, the educational work by the human voice may be supplied by ordinary social intercourse.

The editor of this department is especially interested in the problem of rendering of greater service to deaf children the remnant of hearing which remains to so many of those who are yet so deaf as to require the services of the special schools provided for the education of the deaf. It was in this connection that he cooperated with Dr. Hubby in making the exhaustive tests with three chosen pupils as described elsewhere in this number of THE LARYNGOSCOPE. All three were cases classed in most schools as totally deaf because there was not a sufficient power of sound perception to differentiate between vowel sounds, no matter how loudly shouted at even the closest range, until they had received a long series of exercises for the *education* of the brain to recognize and discriminate between sounds.

Each of the three had been receiving this educational auricular training by means of the speaking voices of men and women for some months previous to the long series of treatments given by Dr. Hubby. Previous to the educational treatment of the hearing, none of the three had been able to recognize any word by ear. In the case of M. C., the educational treatment had not developed any ability to recognize any words with certainty or precision, though she recognized the sounds faintly, and being of keen intelligence, made many good guesses that sometimes almost convinced us that she could eventually benefit adequately by the training. Up to the present time, however, the results have not been of much value.

The case of E. G. is curious in some respects. Before coming to me, she had been for three years in a large institution for the deaf

where the facilities do not exist for doing this individual work of educational auricular training. She had made a good beginning in the acquisition of artificial speech by means of sight and touch, and had made good progress in lip reading, and in writing English. Everything about her is typical of the congenitally totally deaf child of good intellect. If the existence of any power of sound perception had been recognized by the school which she had attended for three years and by the physicians who had examined her, no attention had been paid to it, and no attempt had been made to make it of any service to her.

She was one of the deafest cases in which I have ever continued the educational treatment beyond the weeks necessary to arrive at necessary conclusions. It was a long time before she learned to distinguish with any certainty between even three or four words of widely differing sound. Slowly but surely, however, she showed an increasing ability to comprehend words and sentences by means of hearing alone, till at the time of Dr. Hubby's experiment, it was possible for her teacher to carry on a little conversation with her within the limits of the *hearing vocabulary* she had acquired.

Curiously, enough, though Dr. Hubby found her to be absolutely deaf in her left ear, she nevertheless comprehended the spoken words almost as well when spoken close to that ear as when spoken near the right. Since the failure of the Zünd-Burguet treatment to change the amount of sound perception and the decision of Dr. Hubby that she is too deaf to benefit much by it, the educational exercises have been continued through a school year, and in June, 1916, she was able to hear and to repeat a new history lesson when read to her slowly and distinctly very near *either* ear. Usually any considerable improvement like this in the ability to interpret sounds is also accompanied by improved quality and control of voice. But in this case this auricular training has had very little if any influence on the quality or inflections of the voice.

The third case was that of a boy so deaf that he had reached the age of eight years without acquiring any speech whatever or any comprehension of words. Nevertheless, I found that he possessed sufficient residual hearing to enable us to teach him in a few months to recognize words and short sentences when spoken loudly near his ear, and to repeat them with a fairly good imitation of the tone and inflection. Thanks to this hearing that had previously been of no service whatever to him, we were able to give him a much greater command of language in a brief time than he could have gained in a much longer period with only sight and touch to

aid him. This case was the only one of the three that showed any response to the Zünd-Burguet treatment, and even in this case, Dr. Hubby did not think any very valuable improvement could be expected.

This test would seem to establish the fact that there are many cases of children too deaf to acquire speech without special instruction and who cannot be benefited by mechanical auricular training, who can, however, be educated to interpret the imperfect sounds that reach them and thus acquire a certain ability to comprehend speech through the ear.

In gaining access to the mind through the ear by means of spoken language, we are following the path trodden for millions of years by unnumbered generations. We are, therefore, working in harmony with all inherited and psychological tendencies and reaching an area of the brain that can be developed in no other way. When this door is wholly closed, we must gain access to the intelligence through the other entrances of sight and touch, but if the main door is even slightly ajar, the sensible thing is to squeeze through and, if possible, pry it more widely open.

There are many children in this situation in our schools for the deaf, and, owing to the lack of sufficient teachers and, perhaps also to inadequate appreciation of the possibilities, they are not getting the educational training for their residual hearing that they should have. The medical profession could do much to change this and to induce those in authority to obtain the necessary assistants and to do this very valuable educative work.

Discharging Mastoid Sinuses. A Cure by Closure of Eustachian Tube. A. NOAH SCHILLER, *New York Medical Journal*, Jan. 15, 1916.

The writer calls attention to the importance of the closure of the Eustachian tube in radical mastoid operations, to prevent recurrence of discharge from infection ascending from nasopharynx. His method consists of injecting into the Eustachian tube one ounce of 10 per cent solution of argyrol every second day for two or three weeks. Then alcoholic injections are used, beginning with a 25 per cent solution and increasing up to 95 per cent. This done for a week or so. Then the Eustachian tube is curetted. PACKARD.

BOOK REVIEWS.

Cleft Palate and Hare-Lip. By Sir W. Arbuthnot Lane, Senior Surgeon to Guy's Hospital and Emeritus Surgeon to the Hospital for Sick Children, Great Ormond Street. Third Edition. London. Adlard and Son.

Neither this concise little volume nor the author of it requires any introduction to the medical profession. As a contributor to surgical literature, Dr. Lane is known well enough the world over. The present volume of Cleft Palate and Hare-Lip has been amplified by Dr. Lane, in that he takes into consideration "such measures as are requisite in a considerable proportion of cases to render the condition of the patient as normal as possible after operation." This simply means that aside from obtaining as perfect as possible a result surgically the important question is whether or not the patient is going to have intelligible speech. In nearly every case such speech can be obtained by early and careful speech training. For this reason a chapter is especially devoted to this question.

The book consists of three chapters. The first, written by Dr. Lane, is devoted to the surgical consideration of "Cleft Palate and Hare-Lip." This takes up the mechanics of the condition, the operative procedure for its correction and the post-operative treatment. The operative technique described by the author is profusely illustrated with drawings to elucidate the text, and what strikes one is the simplicity of the technique itself. The author rightly believes, in regard to the best age for operation, that it should be the day of birth or as soon after that as possible.

The second chapter, written by Mr. Cortlandt MacMahon, Instructor for Speech Defects at St. Bartholomew's Hospital, is devoted to "Speech Training." Mr. MacMahon points out the necessity of starting the child's training at the earliest possible age and that in some adult cases, where the most perfect surgical results have been obtained in early operation, the speech is nevertheless very faulty, due entirely to neglect of speech training at an age when the acquirement of good speech would have been an easy matter.

The third chapter takes up the question of the "Dental Treatment of Cleft Palate," and is written by Dr. W. Warwick James. The subjects falling under this consideration are the correction of facial deformities, whether the case has been operated on or not, structural imperfection or misplacement of the teeth, restoration by artificial appliances, etc.

The book forms a very composite treatise on the subject of cleft palate and is to be highly recommended to all those interested in the treatment of this defect. P. F.

Diseases of the Nose and Throat. By Sir St. Clair Thomson, Surgeon for Diseases of the Throat and Professor of Laryngology in King's College Hospital; Laryngologist to the King George Hospital and to King Edward VII Sanitorium, etc. Second edition. New York. D. Appleton & Co., 1916.

The present volume constitutes the second edition of this work, the first edition having been published in 1912, and shows a great many additions to, and revisions of, the text. The author's name is a sufficient guarantee that the work is a splendid one and even a casual perusal of the subject-matter bears this out. As one of the more elaborate textbooks on diseases of the nose and throat (notice that the ear is excluded, which is perhaps a commendable thing) it stands in the front rank and succeeding editions will follow in short order.

One of the features of the book is that the operative procedures are very minutely considered and this applies as much to the simplest operation as to the most intricate. The book is, therefore, of value not merely to medical students studying the subject in a more or less theoretical way, but to the specialist for purposes of consultation. This is especially true in regard to the accessory sinuses. Each sinus is taken up individually and the various operative procedures that have been proposed are described in detail, stress being laid upon those that are in greater vogue and that have given the best results. The description of the operations, whether it concern the septum, nasal growths, adenoids, tonsils, accessory sinuses or larynx, is given in steps and though the text itself is the essence of clearness it is amply elucidated by splendid illustrations. The colored plates, of which there are twenty-two are exceptionally fine. Another excellent feature of the book is the chapter on "Some Operations," which comprises Rouge's operation or sublabial rhinotomy, Moure's operation or lateral rhinotomy, the nasal route to pituitary tumors, intranasal dacryocystostomy, intubation, larynogotomy, tracheotomy and unilateral laryngectomy, all of which are splendidly illustrated. That is not to say that the book is devoted entirely to operative technique. Every topic is approached from the standpoint of etiology, pathological anatomy, symptoms, diagnosis, prognosis and treatment.

One thing seems queer: that in the removal of tonsils, partial removal of these strictures should even be considered. In text-books to-day tonsillotomy, if referred to at all, is merely mentioned as one of the curiosities of the past, and few operators even practice it in preference to complete enucleation of the tonsils. Dr. Thomson's reason for tonsillotomy as the "preferable method for professional singers" will certainly not meet with universal acceptation. In the operation for tonsillectomy Dr. Thomson evidently is a devotee of the guillotine for all the illustrations feature this instrument and the text describes its use. Only brief reference is made to the use of the snare, the author stating that "this method may be employed in adults when there is fear of hemorrhage." Why only in adults? Certainly in adults, with the employment of local novocain anesthesia, its use is far more ideal than that of the guillotine with general anesthesia, and under all circumstances there is far less unavoidable bleeding than with the guillotine. P. F.

Headache in its Relation to Nasal Disease. Dr. Wolff Freudenthal, *New York Medical Journal*, January 1, 1916.

The author lays stress on the importance of nasal examination in all cases of intractable headache and classifies headaches into those due entirely to nasal or naso-pharyngeal disease and those produced by several factors, one of which is found in the nose and throat. He speaks of the importance of polypi, cystic and enlarged turbinates. Another group due to purulent affections of the sinuses.

The author thinks a chronic naso-pharyngitis is one of the most prolific causes of headache. In treating these local conditions, must not overlook the possibility of accompanying systemic conditions also. Packard.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, February 23, 1916.

DR. HENRY L. LYNAH, *Chairman.*

Improved Illumination for the Lynch Suspension Laryngoscope. DR. C. J. IMPERATORI.

In presenting this light attachment for the Lynch suspension laryngoscope before the Section, there is no desire on my part to claim any originality in the idea or design.

It consists of a long light carrier, that slides through a collar on a ball and socket joint. The instrument is a combination of Dr. Lynch's long unattached light carrier and Dr. Arrowsmith's light that was demonstrated before the section some time ago.

The attachment is useful in that it may be lighted before the spatula is inserted in the mouth, with the carrier pulled back; when the larynx is exposed the carrier is then pushed down as far as desired, thus illuminating the field with any degree of light required.

The instrument is made by the Electro Surgical Instrument Co. of Rochester, N. Y.

DISCUSSION.

DR. MCCOY said that the improvements were exceedingly well taken, and covered just the points which had given him most trouble in using the apparatus.

Dr. Arrowsmith showed several improvements, in detail, in connection with the Lynch book, (1) demonstrating the position of my light; (2) a method of fixation of the spatula; (3) an improved form of tooth-plate—combining a trio—(a) two somewhat angulated (right and left) for fixation outside of the central incisors, when they were lacking; (b) a rather broad median plate for use when the central incisors were intact; (c) an improved construction of the tooth-plates, whereby their adjustment to the horizontal bar of the yoke was simplified; (d) a set-screw for the fixation of the tooth-plates to prevent lateral displacement.

Occluded Right Nasal Passage; Apparatus Just Now Applied to Correct by Spreading Upper Dental Arch: Result to be Shown at a Subsequent Meeting. DR. E. A. BOGUE.

The patient is a boy, 15 years of age, referred from Dr. Corwin in Newark. He presented a sigmoid flexure in the nasal passage. The other day the right side was entirely closed, and to-day the left side is larger than the right. A double screw has been put on the case with the idea of bending the bony process above the teeth by means of the teeth. It is practically the operation which Dr. C. V. I. Brown has been advocating for so many years. The patient is presented with the hope that as many

as feel interested in separating at the suture or in an effort to separate which results in giving ampler breathing space, would examine the boy. Dr. Bogue said he hoped to present the patient a month later and give opportunity to those interested to satisfy themselves concerning the condition.

DISCUSSION.

DR. QUINLAN asked if Dr. Charles Quimby, of this city, had not some years ago presented before the Section a similar device; to which Dr. Bogue replied in the affirmative, stating that the patient was Dr. Quimby's own daughter.

DR. BOGUE further said that the principle in the two devices was identical, but that this one has a double screw whereas Dr. Quimby's device had a single screw. The device was adjusted on this patient on Saturday (four days ago) and the screws have not yet been moved, as he wished the members of the Section to see the case before the screw was changed or the conditions altered. The screw will be gradually turned to accomplish the desired results in accordance with the wishes of the patient; which means that the screws will not be turned far enough at any one time to be painful.

DR. QUINLAN asked if the boy's respiration was better since the apparatus was put in place.

DR. BOGUE replied that as yet there had been no change as the apparatus had not yet been put into operation, but that he hoped to bring the floor of the nose down, and at any rate he expects to spread the suture.

Regular Meeting, March 22, 1916.

Occluded Right Nasal Passage; Correction by Mechanism Spreading Upper Dental Arch: Second Presentation of the Case to Demonstrate Result Obtained in Thirty Days. DR. E. A. BOGUE.

Dr. Bogue said that he presented the patient, as he had promised at the last meeting. The pain since then has been about 4 mm. above and about 3 mm. below. The patient had not had any pain. The mother had turned the screw most of the time, consequently there was not so much spreading as might have been secured. The occlusion of the right nasal passage had disappeared, and that naris is now larger than the left. A month ago there was no breathing through the right passage.

Dr. Bogue said that at the last meeting he had stated all that he wished in regard to this rapid spreading, but would be glad now to answer, so far as he was able, any questions on the subject.

DISCUSSION.

DR. HAYS said that at the last meeting Dr. Quinlan had spoken of Dr. Quimby's daughter who had been treated by this method, and that it might interest those present to know something of the subsequent course of the case. He had recently met Dr. Quimby, who said that his daughter was now breathing perfectly. He had put on this double jackscrew in 1903, and she has since had absolutely no nasal obstruction.

DR. BOGUE said that he could add one further point to what Dr. Hays had reported. Dr. Quimby was very much disturbed when his daughter

told him there was a groove in the upper part of her mouth, though Dr. Nelson Black, of Milwaukee, takes the stand that such a groove is the result of the spreading of the upper maxillary, and that the lower edge of the nasal septum is expected to drop into the fissure, and that after that any obstruction due to the crooked septum is removed, though no change takes place in spurs of other excrescences.

DR. CARTER said that he had examined Dr. Bogue's patient carefully at the meeting last month, and found at that time that there was a spur on the left side and hypertrophy of the inferior turbinates on both sides. The spur is still there tonight, and the left nostril is almost obstructed by the hypertrophied turbinate and the spur. The right nostril presents the same appearance as before. He had examined the case very carefully, as he wished to see the advantage, if there was any, in treating nasal stenosis by widening the upper arch. So far as he could see the case was just about the same as it was at the last meeting.

DR. BOGUE said he thought if the patient were called in and questioned as to whether or not there was any change in his ease and comfort in breathing, the report would be as satisfactory as that of any observer. The amount gained was not yet very great, but it was of great value, as it would probably avert the necessity for a submucous operation; and the unnecessary removal of any of the nasal bones is to be avoided.

DR. HASKIN said he did not think these cases of angular deflection of the septum are apt to be really helped by the spreading of the nares except in so far as it gives the patient more space for breathing. An angular deflection would not be straightened out as are the bowed conditions of the septum, which are the ones in which, if a separation of the two maxillary bones is secured, the resiliency of the cartilage pressing down will straighten the abnormality. Where there is an actual bony angular deflection caused by a growth of bone on the superior maxillary, the patient is helped only so far as actual breathing space is obtained; the actual angular deflection will not be straightened out.

Extensive Epithelioma of the Nasal Structure and Appendages. DR. WOLFF FREUDENTHAL.

The patient was a man sixty-four years of age, whose history dated back two and a half years, when he first noticed a pimple on the nose, and at the same time felt some pain. He then went for advice to the French Hospital, where a diagnosis of epithelioma of the nose was made. He was treated with radium for some months, but it did not help him. He was then treated with an electric needle, as he expressed it, which helped him some. Then radium was again tried, with no benefit. After that, he received injections of a certain serum, and the pain became so violent that he could not sleep. Then he went to Dr. Walton Martin, who operated upon him and the pain was relieved. Later, another operation was done, but after that the pain grew worse again. He was given codein and morphin in various forms, but they had a bad effect upon him, producing such intense itching that he could not sleep. The pain persists, and he says that he has to keep his head in a certain position when swallowing in order to get the food down.

The lower portion of the nose has been taken away, and also the turbinate bodies, portions of the maxillary bones, alveolar processes, etc. At

one time he had an ulceration of the hard palate, but that disappeared quickly under treatment. Two weeks ago when he was suffering a great deal of pain, Dr. Freudenthal gave him pyramidon and dionin, which relieved him somewhat. At that time pus was coming from the nose and from the antrum, so under general anesthesia (administered because of the patient's extreme sensitiveness to pain) a good deal of pus was removed; there was quite some bleeding, as was to be expected, but the pain still persists.

The patient was presented with the hope of getting some suggestions for relieving him. The Wassermann reaction was negative. There was no doubt about the diagnosis. It was one of the rare cases where morphin and its derivatives have just the opposite to the usual effect.

DR. MYLES asked if Dr. Freudenthal had tried paraldehyde, to which the latter replied in the negative.

Nasal Deformity Corrected by Bone Transplantation. DR. HUBERT ARROWSMITH.

The patient was a young man who had come under Dr. Arrowsmith's observation three years ago, with the history that three years before that he had expelled a number of sequestra from his nose. The history was clearly one of congenital lues, and the Wassermann reaction was strongly positive. He was put upon mixed treatment, iodids, etc., and last fall, the Wassermann then being negative, a bone transplanting operation was performed, with the result presented.

In anuary of this year, however, the patient had an attack of diphtheria, and some time after that the nose, which had appeared normal up to that time, presented a bleb on the outside, and dead bone could be felt with a probe. Last Sunday Dr. Arrowsmith operated again and took out the sequestra. The bone transplant was denuded of periosteum, but up to the last four or five weeks it had to all indications settled down as a permanency.

The condition is much better than it was, and probably a little later something may be done if the bone transplant does not continue to disintegrate. The operation was done under the Gwathmey oil-ether anesthesia, with great comfort to the patient and operator.

DISCUSSION.

DR. CARTER said that this form of deformity was difficult to treat by any method and that the result secured by Dr. Arrowsmith was excellent for a first operation. Bone when transplanted, however, does better when the periosteum is preserved. It grows more vigorously, and it is still a question if bone transplanted without the periosteum is not absorbed, unless in contact with live bone. If transplanted without periosteum, it should be placed in close contact with the frontal bone, which should be chiseled into, in order to excite osteogenesis. In this case, the bone has not united to the frontal bone. It was placed in contact, but did not unite. Dr. Arrowsmith had already removed one small sequestrum; probably the balance of the bone is dead also and will have to be removed, or it may be absorbed.

In these specific cases the conditions are peculiarly difficult for bone transplantation, as the metabolic processes and the reparative function of the tissues are not up to normal. Furthermore, the bone transplanted

was taken from the rib, and in these old specific cases the rib is nearly always affected by the disease. In the majority of such cases where he had operated, the compact portion of the rib was very thin, and in some instances it was practically impossible to split the rib without destroying the entire rib.

In Dr. Arrowsmith's case, as presented, even if the bone is absorbed, the deformity will not be so bad as before, because connective tissue replaces the bone that has been absorbed. The conditions are favorable for a second operation. Dr. Arrowsmith was to be congratulated on the result he had obtained.

Dr. Hays said that he had meant to bring some photographs which would have illustrated Dr. Carter's remarks. Two years ago he had operated on a syphilitic young girl, and later the bone had perforated through the nose. Two days later, infection took place over the forehead.

The girl had left the hospital in ten days, apparently in good condition and with a good looking nose. At the end of two weeks, a small fistula developed near the inner canthus, which grew larger and larger. Dr. Hays said he hesitated to take the bone out, but finally did so, and much to his amazement enough scar tissue had developed to keep the nose in excellent shape. To-day the girl is able to earn her living as a telephone operator.

Dr. Carter said he did not wish to be misunderstood. What he had meant to say was that bone without periosteum is probably absorbed, but if placed in contact with live periosteum-covered bone one can trace the growth of new bone from the live bone down to the transplant, so that bare bone is certainly osteo-conductive when placed in contact with live periosteum-covered bone. The growth of this bone is limited by the functional adaptability of the part.

Dr. Arrowsmith, referring to Dr. Carter's remarks about the ribs being affected by the disease, said that in this instance it was very difficult to split the rib; it was almost entirely compact bone with very little cancellous tissue.

Rhinoscleroma: Two Cases. Demonstration of Section of Tissue Under the Microscope. Dr. J. D. Kernan.

Case 1: The patient, a man, 27 years of age, was born in Syracuse, Italy, and has been in this country seven years. Parents living and well; no such disease in his family. Patient had never been out of Italy until he came to this country. No venereal disease.

One year ago the nostrils became obstructed, the right one, entirely. No pain or loss of weight. The throat has been affected for six months. No pain; larynx not involved. Wassermann reaction, negative. He has had one dose of salvarsan. Section and culture made. Positive for rhinoscleroma.

Examination showed great obstruction of the nostrils, also involvement of the pillar and soft palate, a general thickening with a worm eaten surface; no tumor formation. The diagnosis was made on the presence of the bacillus and the tissue which showed Mickulicz cells and Russell bodies,—the combination,—in absence of proofs of syphilis and tuberculosis.

Since the patient has been under Dr. Monroe's care, he has been treated once or twice a week with alcohol injections, and the condition in his pharynx has seemed to improve considerably.

Case 2: This patient, K., 21 years of age, is a native of Hungary. His family and previous history were unsatisfactory. So far as he knows, he has been healthy except for the present illness. Two years ago, he first noticed hoarseness followed by dysynea,—at first, only on exertion, but for the last few months this has been continuous. A year ago, his tonsils were removed. How much that had to do with the present scarred and contracted appearance cannot be said.

Six weeks ago the patient came to the Manhattan Eye, Ear and Throat Hospital (Dr. Chappell's service) suffering from hoarseness and severe dyspnea. Examination showed atrophic rhinitis, with extensive scab formations in the nose. In the pharynx, the tonsils were absent, the pillars were contracted, scarred, and deformed. In the larynx, the subglottic space was contracted to a narrow chink by a grayish mass of tissue, of uniform growth on all sides.

Two days later, a tracheotomy was done. For several days great difficulty was experienced in keeping the tube free of thick secretion. The patient was very ill, and the suction pump was used continuously. When he was out of danger and the tracheal wound was clear, the subglottic space was cleaned out with biting forceps and has since remained free. Lower bronchoscopy was done at the time and showed the whole trachea to be involved in the atrophic process, seemingly denuded of epithelium, and covered by thick secretion which rapidly re-formed. The orifice of the left main bronchus was contracted to the size of a small quill, the tissue appearing like white scar tissue. Pathological examination confirmed this.

The man has improved since the tracheotomy tube was removed. The bronchoscopy has been repeated several times, the trachea being cleared and swabbed with argyrol. By means of bougies, the orifice of the left bronchus as been dilated. The nose has been treated with ichthyol tampons. Scabs cause the chief difficulty now.

DISCUSSION.

Dr. Coakley said that he has had a case of nasal rhinoscleroma under observation for seven or eight years, and had tried practically everything, even to autogenous vaccines made from the bacilli cultivated from tissue excised from the nose. The vaccine treatment was given by Dr. Thro for about three years, and the only effect was probable retardation of the process. A small mass was removed from the vestibule in order to give more breathing space, but the improvement was only temporary. Alcohol, mercury, etc., were tried without avail. About two years ago Dr. Francis Carter Wood applied radium on the mass, and the result was most gratifying, the mass being almost entirely absorbed, and the man could breathe through the vestibule on that side perfectly well. The result was better than anything that could have been obtained by operation. Dr. Coakley said he would suggest the use of radium on the first case. In cases where one can apply radium directly to a mass and not at a distance, as in the larynx, the action is very energetic.

PHILADELPHIA LARYNGOLOGICAL SOCIETY.

Meeting of April 4, 1916.

DR. SIDNEY L. OLSHO, REPORTER.

Case of Meningitis of Otitic Origin; Operation; Recovery. DR. GEORGE M. COATES.

J. O., a hospital employe, one day after the tympanic membrane had been incised for an acute otitis media, developed a temperature of 104 3-5 with symptoms of mastoiditis and early meningitis, becoming progressively worse. A simple mastoid operation was performed on the right side. An erosion of the tegmen antri was freely exposed and a considerable amount of turbid fluid evacuated. A large perisinus abscess was discovered. The sinus itself, collapsed by pressure, refilled during the operation. All symptoms disappeared in a few days. The patient was discharged the fourteenth day after operation. There is little disfigurement. A small amount of middle ear discharge persists. The meningitis was evidently of the simple serous type or non-infectitious meningitis of Alexander.

Death Following Tonsillectomy Under Local Anesthesia. DR. GEORGE M. COATES.

The patient was a tall, cadaverous, hollow-cheeked Italian, age 27. The tonsils were large and cryptic. Tonsillectomy on account of rheumatism and frequent sore throat, using a 1 per cent solution of novocain to which had been added a few drops of adrenalin. Operation, uneventful. Five days later patient complains of dysphagia, pain on the right side of the neck, dyspnea. The temperature is 104 and there is swelling and tenderness on the right side. The posterior right pillar is edematous, evidently infected. Incision of same, non-productive. One day later, a large swelling on the right lateral wall of the pharynx was incised. Four or five drops of thin, brown pus followed the knife, preceded by a very intensely fetid odor, which was distinguishable half-way across the room. Signs of a left pleurisy were discovered. Death occurred a few hours after the second incision. No cultures were made. Post-mortem not obtained.

Safety Pin in the Esophagus Expelled During Anesthesia Into the Post-nasal Space. DR. A. SPENCER KAUFMAN.

Miss W., age 19, swallowed an open safety pin, which was located by x-ray about 4½ inches down the esophagus. Ether was administered, causing some retching and vomiting, the patient being unprepared for anesthesia. Thorough exploration with the esophagoscope revealed only a few punctate hemorrhages but no pin, which it was assumed had passed into the stomach. X-ray of the stomach did not reveal the pin. Dr. G. C. Bird then x-rayed the head, revealing the pin, lodged in the post-nasal space, point down. He removed it with little difficulty.

Case of Membranous Infection of the Nose and Antrum, Resulting Fatally. DR. A. SPENCER KAUFMAN.

H. W., white male, age 30. Two weeks after a severe attack of influenza developed a pseudo-membranous inflammation in the left nostril, cultures negative to diphtheria. Membrane tough and re-forms shortly after removal. Extension occurred to left antrum, completely filling that cavity. Patient septic.

Under ether, a preturbinal opening was made into the antrum, then also a counter opening through the canine fossa. The contained tissue, curetted out, was reported to be poorly staining masses of fibrin, blood cells and granular debris giving a culture of pneumococci. Following the operation there occurred a cellulitis of the face, continued sepsis and a myocarditis.

About two weeks after operation an abscess of the left side of neck was opened and drained. An abscess on the right side of the neck developed about six weeks after operation. A facial palsy extended to the muscles of deglutition necessitating tube feeding. Death occurred 48 days after operation. Necropsy not obtained.

Further Study of Tumors of the Uvula (Exclusive of Angioma). DR. P. S. STOUT.

(Published in the August, 1916, issue of The Laryngoscope.)

Technic of Thyroidectomy. DR. QUERVAIN, *Deutsche Zeitschrift f. Chir., Bd.* 134, 1916.

The chief points in the author's technic are as follows: He ligates the arteries, especially the inferior thyroid, before the gland is luxated. The ligation of the usually well developed inferior thyroid should be extrafascial, because the recurrent laryngeal nerve and the parathyroids as well as the capsule veins are best avoided in this way. The best approach is afforded by the sternohyoid space. Whether the goiter tissue is to be removed by enucleation or resection will depend upon the form of the goiter and has no special importance. The isthmus is to be divided and partly or wholly removed only when it is diseased. Otherwise its division is superfluous and a disadvantage, because the collateral vessels at its upper and lower borders are damaged. Whenever possible, as much of the gland is to be left on each side as corresponds to the normal gland lobe so that the recurrent laryngeal and parathyroids will not be exposed. P. F.